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# HIGH TIMES

November 478

## SPECIAL DAB! ISSUE.

KOSHER OG SHATTER



**The Wide World  
Of Extraction**

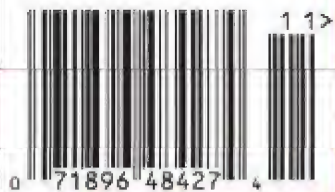
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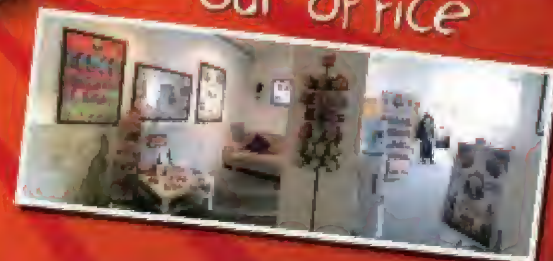
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*“The best place to bring fresh air into the growroom is near the floor, where air temperatures are cooler; the best place to exhaust air is near the ceiling and above the light banks, where air temps are the hottest.”*

—*It's All About Atmosphere*, page 67

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## **47 The 2015 Dab Report**

Colorado correspondent Ry Prichard explores the “Origins of Live Resin”; California concentrate lawyer Rezwan Khan examines the nation’s “Laws of Extraction” (p. 55); and the *HT* staff reviews some of the top electronic nails on the market (p. 61).

## **67 It's All About Atmosphere**

From temperature and humidity to CO<sub>2</sub>, lighting, and intake and exhaust fans, your growroom’s atmosphere dictates your plants’ yield and potency. Today’s tech can help you dial in these essential elements, making life a lot easier on your way to a bountiful harvest. *By Nico Escondido*

## **74 Flowering for Peak Ripeness**

In this excerpt from Jorge Cervantes’s *The Cannabis Encyclopedia*, the world-renowned grow guru and *HT* alum discusses the ABCs of the flowering stage, as well as tips and tricks for achieving big buds fast.

## **89 Good Vape Vibes**

Entrepreneurs are discovering countless niches in the marketplace. Organa Labs and O.pen.VAPE have developed high-quality cannabis oils and a vaporizer pen with which to imbibe them—right down to strain-specific cartridges. *By Dan Skye*

## **99 Phoenix Grow Rises**

Legendary grow-book author and cannabis photographer Mel Frank visits Arizona to check out a huge commercial marijuana facility that produces dozens of pounds of legal pot in a hot, dry desert climate.

## **109 The High Times Interview: Jesse Ventura**

He’s an ex-Navy SEAL and a former superstar professional wrestler. He also served as the governor of Minnesota from 1999 to 2003. Jesse Ventura has lost none of his edge, still calling out corrupt politicians and shady government doings. *By Dan Skye*

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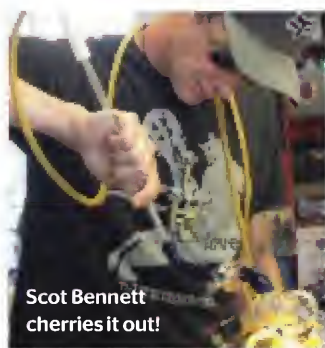
Live-resin leaf sculpted by E-Merge

## ► Glass Artist of the Month

Cherry Glass is a family-owned, glassblowing business in Minnesota. Scot Bennett, its star artist, recalls: “The day a spider came home in our bag of groceries was the beginning of our ‘Nature Line’ of pieces.”

After killing the bug, he decided to incorporate the critter into his work. He electroformed it (commonly referred to as “dipping” an item in metal.) Scot says, “Anything organic is an opportunity to create art—flowers, butterflies, snakes—anything that was once living or green.”

Short Minnesota summers mean that the family has only three months to collect bugs. So they gather what insects they can and acquire the rest from collectors and friends who ship the prized pipe items to them. “We also incorporate crystals, stones and Brazilian agate slabs into our work connecting everything together with different color



Scot Bennett cherries it out!

patinas,” Scot explains.

He started blowing glass in 2002. Following a four-year apprenticeship, he founded Cherry Glass ([cherryglass.net](http://cherryglass.net)) in 2006. Six years later, his mother

Linda began collaborating with Scot electroforming his pieces. Adding to the family affair, Scot’s wife, Ryan, is currently a Cherry Glass apprentice.

Scot says proudly: “We’re proud to produce art that’s made in America.”

*Check out the work of Scot Bennett online.*

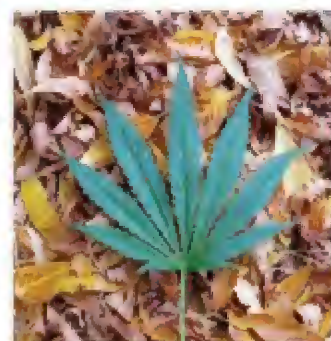
## ► Art of the Dab

As dabbers know, the stuff you dab is sometimes gooey. But it also provides a perfect medium for the creative stoners among us. Recently, artists have begun fashioning art out of dabs! But is it really art? You decide. Check out our online gallery of concentrated creativity.



## ► Harvest Huge!

Your outdoor garden is almost ready to be chopped down. But there’s a lot more to harvest than just cutting down your plants. Learn the proper way to harvest, dry and cure at [hightimes.com](http://hightimes.com) when it’s time to reap your reefer.



## ► High Fall

There are lots of things to do come autumn, aside from harvesting your gorgeous plants. We’ve got a comprehensive list of cool things to do when the weather cools off. Read our “Stoner’s Guide to Autumn” this month!



## ► Smoke Gets in Your Highs

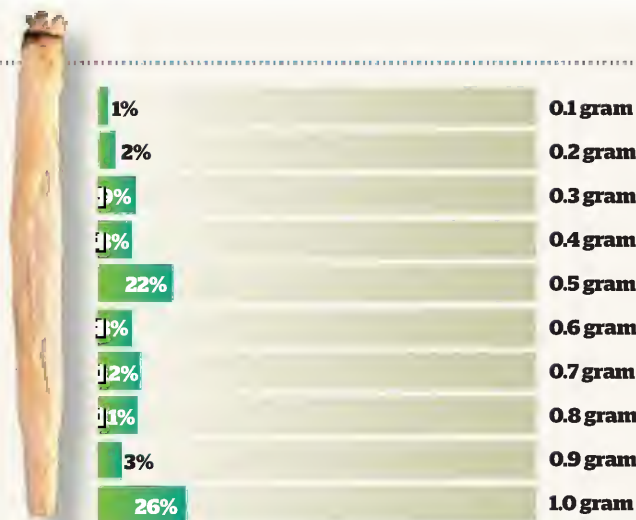
Editor-in-chief Dan Skye goes through his archives once again to present a cavalcade of cannabis users exhaling extravagantly. Check out a gallery of pot lovers dedicated to the joy of puffing.

### POT POLL

## How big is your joint?

In an online article on our website, author Jon Gettman examines the recent report by the Office of National Drug Control Policy, wherein researchers try to determine how much pot is in the average doobie (“Estimating the Size of A Marijuana Joint,” July 15, 2015). According to the report: “Based on a variety of considerations, the amount of marijuana in a typical joint is assumed to be 0.43 grams/joint.” Really? Fortunately, Jon asked readers to literally weigh in. With over 2,700 responses, most said they roll their jays bigger!

Cast your vote in our latest poll online!





# Moto

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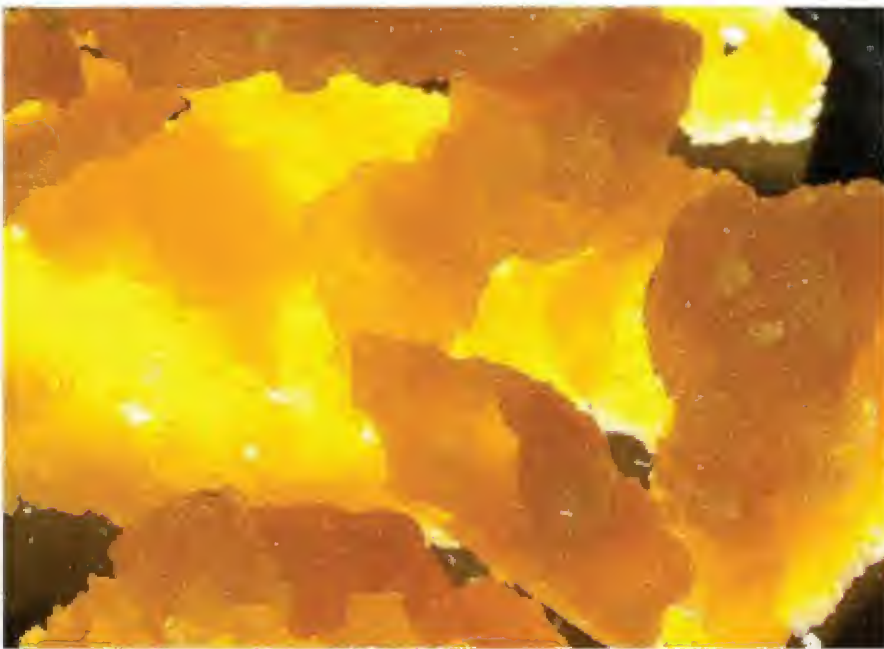
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## The Wonderful World of Wax

**I**t's been more than three years since we published our first official dab feature ("The Concentrate Revolution," Feb. '12), and in that time the culture and science surrounding cannabis concentrates has exploded (no pun intended). At every Cannabis Cup, we see throngs of young stoners sporting baseball caps studded with hatpins and mini-rigs dangling from their necks, toting Pelican cases and sucking down shatter. Technologically, we've seen the advent of closed-loop systems that are certified safe and even programmable; cold traps that capture terpenes during the purging process so that they can be reintegrated afterward... hell, there are even people who have abandoned water or solvents altogether and are making dabs using hair-straighteners and T-shirt presses (a.k.a. rosin tech).

Regardless of whether you prefer bubble hash or BHO, wax or shatter, dry-sieve or even rosin, there's one thing they have in common: They're all derived from dried, cured cannabis. All of them, that is, except for the concentrates known as "live resins," which are extracted not from dry buds and leaves, but from freshly harvested, flash-frozen plants. These aromatic, effervescent extracts are the subject of our main feature, "*It's Alive! The Origins of Live Resin.*"

Of course, as the demand for concentrates grows, so too does the number of people stepping in to satisfy it—many of whom are unskilled in the use of flammable solvents, creating a public-safety risk and drawing negative media attention. In response, law-enforcement agencies across the country are handling hash-extraction issues in radically different ways. While states like Colorado strive to institute a sensible regulatory system that benefits consumers and patients and ensures the safety of both the concentrates and those who make them, other states have predictably taken a more draconian approach. *High Times* examines these issues in our investigative article "The Laws of Extraction."

Finally, for all you concentrate connoisseurs out there who are looking to trade in your torches for a more civilized and discreet heating method, we provide a rundown of some of the top electronic nails on the market. Plus our illustrious editor-in-chief, Dan Skye, visits the headquarters of O.openVAPE, one of the nation's top vapor-pen manufacturers, to learn the secrets of their success.

So ready your rigs and fire up your torches, folks—the 2015 Dab Report is here!

Infamously yours,

*Bobby Black*

Senior Editor

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*T. Sanford  
Lake Isabella, CA*

**Cup Congrats**

I'd like to say thanks for putting on such a great Cannabis Cup in San Francisco, and especially for the outstanding Super VIP experience that my wife and I shared. All of your staff, the writers and editors and Cristina Buccola, your general counsel, are great people, and they treated us really well.

We haven't had the opportunity to partake in cannabis given that I was in the active military for most of my adult life. After I received a medical discharge, I quickly sought out the plant for its medicinal benefits. Thankfully, a military veteran and marijuana activist in Hawaii introduced us—and the rest is history. From that moment on, I knew I wanted to be a part of the movement. This past weekend's experience put us right in the mix. I'm grateful for that. Again, thanks for the great experience, and we look forward to attending future Cups.

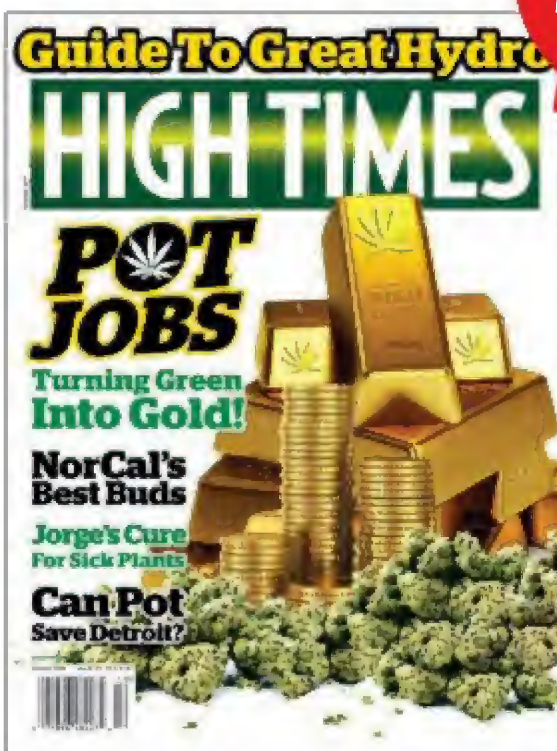
*J. and A. Martin*

The High Times NorCal Cannabis Cup was the best ever! My boyfriend and I go every year, and the Cow Palace was great! We *loved* the VIP lounge—the snacks and the couches and music. It was so nice to take a little break and replenish before venturing out again. There was so much space to walk around, and it wasn't too hot but still summery. The Steel Pulse concert was phenomenal. Everyone from *HT* was so nice—like always! All in all, the Cup was five stars this year! We love *High Times*!

*A Stoner Couple  
San Francisco Bay Area*

**Miracle Meds**

I've been diagnosed with trigeminal neuralgia, which is one of the most painful afflictions there is. People



**In your opinion, when is the appropriate time to tell your children that you smoke marijuana? Should I wait until they're of an age that they can fully understand what it is?**

literally commit suicide because of the pain, and it's something that doesn't go away. I was told to take hydromorphone (Dilaudid), which is a highly addictive and very strong opioid that makes me hyper. (I am allergic to other pain meds.) It didn't work: I waited two hours, with no relief. At that point, I ate a marijuana brownie—against my doctor's advice—and within a short time, the pain was gone and I was able to sleep.

If the neuralgia comes back, I'll be eating many more pot brownies. (I have chronic asthma, so smoking is out of the question.) I am totally convinced that marijuana is what caused the pain to go away.

*Peggy Bragg  
Washington*

**Pot & Parenting**

I have a tough question for you. I'm married and the father of a 2-year-old boy. My wife will soon give birth to a beautiful baby girl. I smoke medical marijuana to ease the pain caused by injuries from an accident. I've had a massive lower-lumbar fusion, complete with rods and screws. I'm practically robotic-moving, but I will never touch pharmaceutical

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painkillers: There are addiction problems in my family, and I've taken them myself in the past following previous surgeries. I have no idea how people can put that poison into their body and still function. My wife doesn't smoke and never has, but she believes medical marijuana is a blessing. My question for you: In your opinion, when is the appropriate time to tell your children that you smoke marijuana? Should I wait until they're of an age that they can fully understand what it is and what it's being used for?

*Mean Green Parent*

Dr. Mitch Earleywine, author of *Parents' Guide to Marijuana*, responds: Every child is different, but you can start laying the groundwork at any age. As you come across relevant media coverage, or in other discussions that you have with them, point out how important it is to help the sick. Emphasize that some medicines are better than others. Stay candid about addiction in the family and Mom's decision not to use. And when the time comes, stress that marijuana use early in life—especially just to relieve boredom—frequently leads to problems, but that adult use in safe settings is no reason to penalize anyone. I bet you're doing this sort of thing now, so keep up the good work.

**Dercum's Disease & Medical Pot**

I'm a 36-year-old female. I've recently been diagnosed with Dercum's disease. Most people—even doctors—have never heard of it. In fact, there is currently only one doctor in the US who specializes in it. It's one of the top 10 rarest diseases and also one of the top 10 most painful. I live in Louisiana, which just passed a medical marijuana law, but the medicine probably won't be accessible for another few years, and the law allows only three types of patients to use it. I'm the mother of two girls—a 5-year-old and a 15-month-old—and I want to be part of my daughters' lives. I want to do activities with them and live as happily and as pain-free as possible—not be confined to my bed or sofa, in so much pain that I can't even hold my beautiful girls. Please Google "Dercum's disease" and you'll see that our small network of people could really use some big-time support. Thank you for your time.

*Melody  
Louisiana*



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**DAB REPORT** Double, double, toil and trouble—butane drip and oil bubble! Here's an up-close view of some freshly extracted Mob Boss Lemon G live resin in the collection basin as it begins the first stage of its purge. For the full scoop on these delicious dabs, check out our feature *It's Alive: The Origins of Live Resin* on page 47. Photo by Ry Prichard

**Contact  
High**







**IT'S ALL ABOUT ATMOSPHERE** A lot more than meets the eye goes into growing a successful crop of top-notch ganja. Atmospheric and environmental conditions play an integral part in any growroom, no matter the size of the garden. For more on atmospheric control and the latest in remote control and Wi-Fi technologies check out "It's All About Atmosphere" on page 67. *Photo by Nico Escondido*

**Contact  
High**



**Contact  
High**

**RAISING ARIZONA** Renowned marijuana cultivation book author Mel Frank toured a massive legal marijuana growing facility in Phoenix. Starting on page 99, he illuminates what it takes to manage a pot production center that perpetually grows strains like the Ghost OG tops featured here. *Photo by Mel Frank*









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# Highwitness News

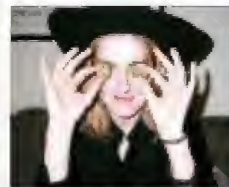
**Amanda Backs Pot!**



Entertainment

**Triumphant Torres**

Mackenzie Scott delivers with *Sprinter*. p.34



Food

**Outrageous Oatmeal**

Start your day with a bowl of ganja goodness. p.40



## Trying Patients' Patience

More states are passing legislation acknowledging the healing properties of CBD. But while these measures raise medical marijuana's profile in the public eye, they do little to provide people with legal access or relief. *By Paul Armentano*

Scientists identified **cannabidiol** in 1940, some two and a half decades before the discovery of pot's most popular cannabinoid, THC. But until recently, fairly little attention has been paid to CBD.

Unlike THC, cannabidiol does not induce euphoria in those who consume it—rather, the compound tempers THC's psychoactivity. Like THC, CBD possesses a variety of therapeutic properties, including anti-psychotic, anti-tremor, anti-inflammatory, anti-oxidative and anti-diabetic activity. A limited number of human trials report that the compound is safe and well tolerated.

In recent years, the majority of attention paid to CBD has revolved around its potential to mitigate symptoms in children with rare forms of intractable seizure disorders, such as Dravet syndrome. One recent study, published in May in the journal *Epilepsy & Behavior*, reported that 85 percent of epileptic children administered CBD-enriched products showed a reduction in seizure frequency.

Like other cannabinoids found in the marijuana plant, CBD is classified as a Schedule I controlled substance under federal law. (The Food and Drug Administration reaffirmed CBD's prohibited status as recently as 2013.) Currently, five separate bills are pending in Congress to deschedule CBD and allow its medical use; to date, however, none have been slated for legislative debate. In February, the FDA sent warning letters to a number of firms marketing CBD products in the United States. More recently, the agency affirmed that marketing CBD products as dietary supplements is a violation of federal law.



Congress is allowing medical use of CBD to languish.

In 2014, lawmakers in 11 states—Alabama, Florida, Iowa, Kentucky, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Wisconsin and Utah—enacted measures concerning the medicinal use of CBD, primarily by adolescents. Most of these laws permit its use only as part of an FDA-approved

clinical trial (since trials involving Schedule I substances must be conducted in partnership with the federal government). Some states, like Florida and Missouri, are seeking to establish regulations overseeing the statewide production and distribution of CBD-enriched cannabis for qualified patients. To date, however,

« none of these in-state programs are operational, and it remains uncertain when—or if—they ever will be.

Nevertheless, several additional states followed suit this year with the passage of their own CBD-specific laws. Like the first wave of CBD measures, these laws are largely unworkable. For example, Georgia's highly publicized law allows patients to legally possess CBD only if they acquire it from a legal-marijuana jurisdiction like Colorado. Virginia's new law similarly demands that patients obtain CBD from unspecified out-of-state sources, and allows an affirmative defense from criminal prosecution only for those who do. Oklahoma's law seeks to allow the possession of liquid preparations containing CBD, but only in instances where the compound is explicitly derived from hemp seeds or stalks—a demand that is impractical at best and impossible at worst. (According to a 2014 report published by Project CBD, "Cannabidiol can only be extracted from the flowers, leaves, and, to a very minor extent, the stalk of the hemp plant.")

In Texas, CBD oils are available only with a doctor's valid "prescription"—but as long as CBD remains federally illegal, technically no doctor can issue such a prescription.

## Is sacrificing the whole plant in order to legalize the use of a single cannabinoid—even one as promising as CBD—an ideal alternative for patients?

While cannabidiol's therapeutic properties are not in dispute, the larger question remains: Is sacrificing the whole plant in order to legalize the use of a single cannabinoid—even one as promising as CBD—an ideal alternative for patients? Not by a long shot.

Medical marijuana patients have long insisted, based on personal experience, that whole-plant cannabis is greatly preferable to its isolated components. Scientific evidence confirms this assertion, finding that various naturally occurring cannabinoids and terpenoids work synergistically with one another to achieve maximum health benefits. Writing in the journal *Pharmacology & Pharmacy* in April, Israeli researchers reported: "Our findings [show] that CBD in the presence of other plant constituents improve the dose-response. [This] higher efficiency ... might be explained by additive or synergistic interactions between CBD and minor phytocannabinoids or non-cannabinoids present in the extracts." CNN's chief medical correspondent, among others, has recognized this phenomenon as

the "entourage effect."

Ironically, were it not for the advent of legal whole-plant marijuana, most of today's crop of CBD-only lawmakers wouldn't be aware of cannabidiol, much less advocating for it. The reality is that patients in medical states—and those who provide for them—are the ones doing the most to promote cannabidiol as a therapeutic agent. And it remains these patients and their caregivers—not politicians—who are making CBD legally accessible to others in need.

Do CBD extracts provide relief? Absolutely, they do. But, ultimately, the law shouldn't force patients to settle for using an isolated compound of the cannabis plant rather than the whole plant—including all of its cannabinoids and terpenoids and their synergistic effects. People should have safe, legal access to both options, and politicians—even well-intentioned ones—shouldn't restrict the right of patients to choose the most suitable one. ✨

*Paul Armentano is the deputy director*

### HIGH FIVE

## Maddening Myths

For the Feds, telling lies about pot is a full-time job.



### Not Enough Studies

**Myth:** Feds claim there's insufficient research to allow rescheduling of pot under the Controlled Substances Act.  
**Reality:** Marijuana is among the most analyzed plant substances in human history, with over 20,000 scientific studies and reviews worldwide published to date concerning the chemistry and pharmacology of cannabis compounds and the endocannabinoid system.



### Gateway Drug

**Myth:** Cannabis use is a conduit to abusing hard drugs like heroin and coke.  
**Reality:** This theory has been roundly debunked. Researchers since the 1980s have identified alcohol as the main "gateway drug." Furthermore, an extensive study by University of Florida researchers in 2012 found that high-school seniors who drink are 16 times more likely to use illegal drugs.



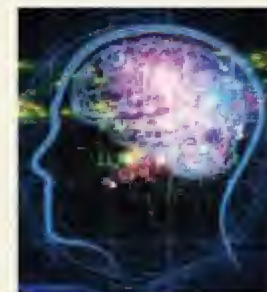
### Causes Cancer

**Myth:** Smoking pot is as dangerous as smoking tobacco.  
**Reality:** Several studies indicate that pot poses no significant risk of cancer, while other evidence points to weed as a potential cure for the Big C, with THC shrinking tumors in lab rats. Famed med-pot patient Angel Raich's oncologist attributed her brain cancer's suppression to cannabis use.



### Causes Crime

**Myth:** Medical marijuana dispensaries boost neighborhood crime.  
**Reality:** Medical pot shops actually deter neighborhood crime. This was substantiated in a 2011 study by the RAND Corporation, which found that crime increased (up to 114 percent) in LA neighborhoods once the dispensaries closed. City Attorney Carmen Trutanich pressured RAND to retract the report just one month later.



### Damages IQ and Brain Function

**Myth:** Pot causes cognitive impairment.  
**Reality:** Even heavy pot use has no detrimental effect on cognition, according to a 2001 Harvard study. A 2009 University of Saskatchewan report found that synthetic THC increased brain-cell formation by 40 percent. A 2013 research from the University of Bonn indicates that cannabis strengthens cellular subunits of the brain.



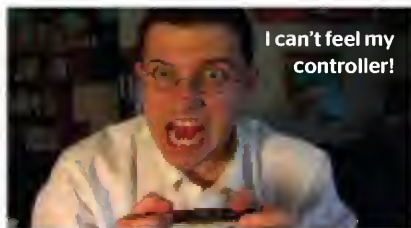


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### **E-Sports League Begins Drug Testing**

Gamers have been put on notice to clean up their acts as the world's largest competitive gaming organization, the Electronic Sports League, has initiated a drug-testing program. The ESL began testing for performance enhancing drugs at its ESL One tournament in Germany and is working closely with the German and World Anti-Doping agencies to decide the scope of its banned substances and the penalties to be doled out to violators.

PED use in gaming became an issue for the ESL when a player claimed he and his team used Adderall during a tournament in Poland while playing for \$250,000. The amphetamine is banned in most professional sports.

Gamers could also be tested for beta-blockers, which are popular in e-sports. No word yet on pot's status in the ESL, however, it is among the substances banned by WADA.

### **Chris Christie Wants to Take Away Your Legal Pot**

New Jersey Governor and noted glutton Chris Christie is attempting to earn some socially conservative street cred for his long-shot White House bid by taking on marijuana legalization. While legal pot in Colorado and Washington State has proven both popular and profitable, Christie nonetheless threatened that, should he be elected president, the party would soon be over.

"I'm anti-marijuana. I believe it should still be illegal," Christie warned while campaigning in New Hampshire. "If you're getting high in Colorado today, enjoy it until January 2017, because I will enforce the federal laws against marijuana as president."

While Christie has supported state's rights when politically convenient, he dropped that act when discussing states that have legalized recreational marijuana. "We have a federal law on the books that says marijuana is illegal in this country. **Illegal. No ifs, ands, or buts about it.**"

### **FLYING HIGH IN OREGON**



Next time you're flying from Portland to Eugene, you can keep that stash of legal chronic in your carry-on, since passengers on all in-state flights in Oregon will be permitted to board with up to 1 ounce of cannabis—the state's legal limit—in their possession.

Portland International Airport changed its policy on July 1, the same day that recreational cannabis became legal in Oregon. Passengers with pot don't have to take any special measures, though if TSA agents discover the weed, they'll notify airport police, who will then verify that the amount doesn't exceed an ounce and that the passenger is booked on an in-state flight.

Unfortunately, although neighboring Washington also has legalized weed, carrying it across state lines falls under the jurisdiction of the federal government and its blanket pot prohibition. However, Washington's Sea-Tac airport also allows in-state passengers to fly with weed.



Amanda pulls tubes in *Ted 2*.

### **Seyfried Says: Free the Weed!**

Amanda Seyfried thinks marijuana should be legal, even though she doesn't partake of pot herself.

"I think it's a wonderful thing, and lots of people use it responsibly, and it should be legal," the 29-year-old actress told the London *Sunday Times*.

Unfortunately, Seyfried suffers from anxiety, a condition that pot can exacerbate, so she steers clear of it in real life. However, her *Ted 2* character, attorney Samantha L. Jackson, rips plenty of bong hits onscreen—and that's just fine with Seyfried: "They could have put a bong in every scene as far as I'm concerned."

The *Mean Girls* star is also frustrated by the blatant hypocrisy of pot prohibition: "I don't understand how people can die all the time from alcohol poisoning, yet pot is so stigmatized."

Seyfried is making plenty of sense. Here's hoping she finds the right strain to treat her panic attacks.

### **Senators: Study the Medical Benefits**



Warren wants weed research.

Senator Elizabeth Warren (D-MA) has once again placed herself at the forefront of progressive politics in America, issuing a letter calling on the heads of various federal agencies—including the DEA, the Office of National Drug Control Policy and the Department of Health and Human Services—to answer a series of detailed questions regarding the federal government's role in medical marijuana research.

The letter, which was signed by seven other senators (all Democrats), insists that the federal government has a responsibility to investigate the efficacy and benefits of medical cannabis. (It has long been standard operating procedure for the Feds to fund only those studies that seek to find harmful effects in marijuana use.) The senators proposed that the Feds should be collecting data and performing clinical trials in the 23 states (plus the District of Columbia) that have already legalized medical cannabis.

Additionally, the group urged the federal government to work with "independent scientists" and to remove all unnecessary barriers to medical marijuana research. The senators also asked the DEA for a "timeline" for the Food and Drug Administration recommendation for rescheduling cannabis under the Controlled Substances Act.



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## CA Okays Organ Transplants for Pot Patients

Starting on January 1, 2016, California medical marijuana patients will finally be eligible for organ transplants. Governor Jerry Brown signed Assembly Bill 258, which modifies the state Health and Safety Code to prohibit hospitals, physicians and procurement organizations from denying organs to potential recipients based solely on their pot use.

While better late than never, this law is long overdue: Medical marijuana has been legal in California since 1996, and many med-pot users have died after being unfairly rejected for organs that might have saved their lives.

Passage of the Medical Cannabis Organ Transplant Act was critical because so many people with diseases that require transplants—such as hepatitis C—use marijuana to treat their symptoms. This bill should finally put an end to the illogical and appalling denial of life-saving organ transplants to people simply because they use pot.

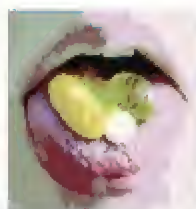
## Paralyzed for Selling Pot

Details continue to emerge in a tragic case that left an African-American man paralyzed, amid continuing questions about a police raid.

Julian Betton, 30, was shot at least nine times by local drug-enforcement officers in Myrtle Beach, South Carolina, during an April raid, leaving him paralyzed from the waist down and in a coma for six weeks.

Police obtained a warrant after an undercover informant bought weed from Betton twice—once for seven grams, the second time for eight grams. The cops allege that Betton, who was armed at the time of the raid, fired first as they burst through the door of his apartment—a claim that Betton denies. He was eventually charged with three counts of pot possession with intent to sell, but an independent prosecutor reviewing the case found no evidence that he ever fired a gun. Betton has yet to be charged with any firearms violations.

## TRIP LIGHTLY



Have you tried “microdosing” yet? It’s the new international phenomenon of consuming modest quantities of hallucinogens like acid and ‘shrooms. According to proponents, the primary advantage of microdosing is achieving some of the psychological benefits of tripping without the overwhelming mind-melt. Some microtrippers have reported improvements in their perception, mood and focus.

A typical micro-dose is 10 micrograms of LSD; standard doses run anywhere from 50 to 150 micrograms. One method of ingestion is to soak a blotter hit in water and then drink a portion of the “acid aqua.”

Although microdosing is becoming a 21st-century trend, some believe that the practice actually predates the dawn of humankind. According to the late Terence McKenna’s “Stoned Ape” hypothesis, microdosing by primates assisted their cognitive evolution and helped us become the rational humans we are today.



Giddy Up and Too Short present James with new wheels.

## Too Short Stands Tall

Rapper Too Short and Colorado ganjapreneur Giddy Up (owner of EmoTek Labs) got together to help out a medical marijuana patient who was shamefully treated by police during their raid on a California dispensary.

Last month, we reported that officers from the Santa Ana PD were caught behaving badly on security cameras during a raid of Sky High Holistic. A lawsuit filed on behalf of the dispensary alleges that the police used excessive force and caused \$100,000 in damages. However, the most disgusting part of the raid happened when two cops mocked wheelchair-bound amputee Marla James, 54, who works at Sky High. In the video, a male officer asks, “Did you punch that one-legged old [woman]?” To which a female cop replies, “I was about to kick her in her fucking nub.”

Giddy Up and Too Short saw the video and wanted to reach out to James. After finding out that her wheelchair was 10 years old, the pair decided to gift her with a brand-new power chair, the spiffy Jazzy 600 ES.



Greenhouses line the Pit River tribe's XL Ranch.

## Reservation Raids

Several federal agencies, including the DEA and the Bureau of Indian Affairs, raided two California tribes raising extensive pot gardens. The raids came despite the recent Justice Department policy change that permits marijuana cultivation on sovereign tribal land.

The Feds were aided by state and local law enforcement in raiding the Alturas Indian Rancheria, home to the Achomawi tribe, and the XL Ranch, home to the Pit River tribe, which consists of Achomawi and Atsugewi Native Americans. Both reservations are located in Modoc County, tucked away in California’s far northeast corner.

The Feds seized at least 12,000 plants and more than 100 pounds of dried cannabis flowers between the two sites. Prosecutors allege that the tribes were conspiring with Canadian cigarette producer Jerry Montour to illegally distribute the cannabis internationally.

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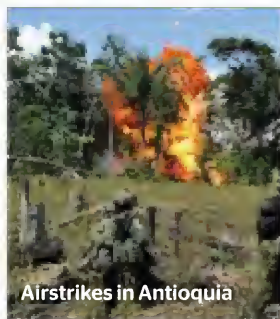
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## HIGHWIRE

## Dispatches from the international drug war. *By Bill Weinberg*



Airstrikes in Antioquia

### Colombia: Peace Talks Resume as War Escalates

Colombia's FARC guerillas called off their six-month-long unilateral ceasefire after a military airstrike in the country's Cauca region on May 22 left 26 of its fighters dead. When a new phase of peace talks opened in Havana, Cuba, three days later, FARC leaders appealed to the Colombian government to instate a bilateral ceasefire. Instead, the very next day, Colombian forces carried out a mixed land-and-air assault on a camp of the FARC's 18th Front in the Pacific coastal region of Chocó, killing 41 guerrillas, followed a day later by new airstrikes targeting the FARC's Fourth Front in Antioquia, killing 10 more fighters. Among those killed in the Cauca strike, according to FARC, was a guerrilla leader taking part in the Havana peace talks.

Shedding light on the roots of the continuing conflict, the *New York Times* on June 2 followed up on the Colombian government's encouraging decision to halt the US-led program of spraying glyphosate to wipe out coca crops. The report found that even in the area known as "La Macarena" (in the eastern Andean foothills of the



Busted on the high seas

### Italy: Hashish Cargo Ship Seized in Mediterranean

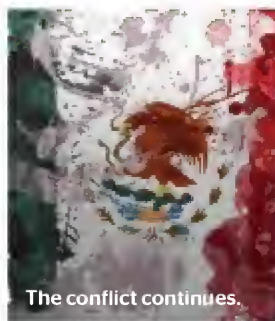
Italian police, in a joint operation with Turkish, French, Egyptian, Spanish, Moroccan and Europol forces on June 5, intercepted a Turkish cargo ship in the Mediterranean carrying some 12 tons of hashish valued at 40 million euros. The ship's 10 Turkish crewmembers were also detained.

The Italian Coast Guard received a tip from Turkish authorities that there were drugs aboard the vessel, which was sailing from a Moroccan port. Troops intercepted and boarded the ship in the Strait of Sicily, which separates Italy from Tunisia.

Meta region), the program has fallen short of expectations. The Colombian government had hoped to make the region a showcase of alternative methods to combat coca cultivation, including providing aid to encourage "substitution crops" like cacao, corn and plantains. But eight years after the Macarena program began, the promised roads and electrification have still not been delivered, leaving the region in isolation and squalor—exactly the conditions that led the local *campesinos* to start growing coca and supporting the FARC in the first place.

### Mexico: New Massacre in Michoacán

On May 22, according to Mexican authorities, at least 43 people were killed in a shoot-out between federal police and a gang



The conflict continues.

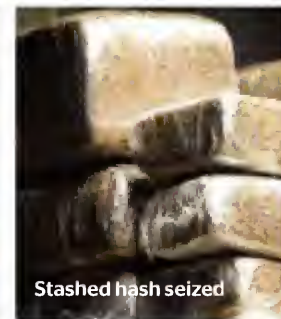
allegedly linked to the New Generation cartel at a ranch called El Sol in Michoacán state. But this official version is increasingly being questioned: Survivors gathered at a local morgue to collect the bodies of their loved ones told reporters it wasn't a shoot-out but a "massacre," in which unarmed villagers were summarily killed by police. By the federal authorities' own admission, despite 43 people being killed (including a single police officer), only 36 firearms were recovered at the scene—suggesting that at least

some of the "gunmen" were unarmed. Mexico's National Human Rights Commission has since opened an investigation.

The claims of a massacre at El Sol echo similar charges in an incident that left a disputed number dead in a supposed confrontation between federal police and a narco-gang at the Michoacán town of Apatzingán in January. But the massacre at El Sol may have been revenge on New Generation followers (real or perceived) after an incident earlier in May, when cartel gunmen fired on a police helicopter, forcing it to make an emergency landing.

### Pakistan: Another Record-Breaking Hash Haul

Pakistan's Coast Guard on May 5 announced the seizure of more than three



Stashed hash seized

tons of hashish in a raid on an oil tanker bound for the Middle East. The tanker was intercepted after it set sail from the port of Karachi. Acting on a tip, the guardsmen used power tools to pry open a secret chamber where the stash was hidden. Major Zafar Ahmed said the haul was the Coast Guard's biggest ever, with an estimated value of \$50 million in the Middle Eastern countries where it was bound.

Hashish interceptions on the Arabian Sea route between Pakistan and the Arab states have soared over the past year, but this marks the first time the stuff was hauled in an oil tanker rather than a small merchant craft. Stepped-up policing has been snaring boats once thought small enough to slip through the net, with traffickers now apparently using ships they hope will be too big to come under suspicion—pointing to the co-option of the legal shipping and oil industries. Pakistan is a transfer point for hashish originating in landlocked Afghanistan, the region's major producer, where opium is also booming. 🌿

*For updates on these and other stories, see Bill Weinberg's websites, [GlobalGanjaReport.com](http://GlobalGanjaReport.com) and [WorldWar4Report.com](http://WorldWar4Report.com).*

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# Ganja Meets Gore

Horror master Eli Roth's ghoulish flick gives new meaning to the word "edibles."



**Powerful Peruvian weed** plays a central role in *The Green Inferno*, a horror film set deep in the Amazon rainforest. Director Eli Roth, creator of the cult classic *Cabin Fever* and the gory *Hostel* film series, confesses to *High Times*: "I love stoner movies—I grew up on Cheech & Chong, *Fast Times at Ridgemont High*... This is the first movie I wrote with weed as an important plot point."

The film was shot mostly on location in Peru, with the cast and crew traveling back and forth to a set on the Amazon



This looks like a very bad trip.

River every day. As actor Daryl Sabara (who, fittingly, plays a stoner in the movie) recalls: "The current on the Amazon was strong, so we would smoke pot so as not to get sick.

After a day of shooting, we would be covered with mud and blood—we'd go in the river and wash off, then smoke some bowls and take the two-hour ride back up the river. It was an amazing ride. The sky would open up, and it was beautiful."

Despite its beauty, the rainforest serves as a backdrop of pure terror in *The Green Inferno*. A group of well-meaning college students takes their humanitarian protest from New York City to the Amazon jungle, only to become the prisoners of the indigenous tribe they came to save. "The original creative

impetus for the movie was: What would happen if you got a bunch of cannibals stoned, and they got the munchies?" Roth divulges.

And what about that important plot point involving weed? "I wanted there to be a mythical strain of supersonic weed, as if it had ayahuasca in it," Roth says. "*The Green Inferno* has an epic weed scene that I've never seen in a movie before."

Locals provided all of the pot used during filming, both onscreen and off. *HT* hears the set was smoked out every day! "I wanted to make a movie that's entertaining every time you watch it," Roth asserts, "and this is a great one to smoke and watch. See this one with a bud, for sure."

*The Green Inferno* opens September 25.

## Pro-Pot Puppets



Bud Greenfield and Nugget are the stars of *The Green Report*, a YouTube news show about cannabis. The show, like the puppets, is the brainchild of puppeteer Chris Chappell, a marijuana-legalization activist who delivers *The Green Report* from his home studio in

North Carolina. Chappell operates Bud and Nugget simultaneously—one on his left hand, the other on his right—in front of a green screen, adding the weed-leaf background in post-production, as well as a cloud of smoke whenever Nugget does a bong rip. The stoner puppets deliver the latest from the CAN newsroom (get it?) with a laid-back, lighthearted tone, but their message is a serious one: It's high time to end the War on Drugs and legalize marijuana.

Check out the *Green Report* at [youtube.com/cannnewsroom](http://youtube.com/cannnewsroom).



### Scent-semilla

Inspired by cannabis legalization in Colorado, this fragrance collection from Dawn Spencer Hurwitz speaks to, and of, a cannabis culture that has been thriving since the Jazz Age and is now moving into a monumental new era. Four fragrances are available: The Green House is redolent of a growroom; I Love You Mary Jane reflects the aroma of sticky nuggets; Agrestic conjures the scent of an outdoor grow; and Rocky Mountain High is a smoky, woody scent. A little dab (of fragrance) will do you! [dshperfumes.com](http://dshperfumes.com)



Mackenzie Scott achieves a fine balance.

# Torrential

A sublime sophomore album heralds the arrival of a new indie heavyweight. *By Mary Jane Gibson*

**Sprinter**, the second LP from 23-year-old Mackenzie Scott, who records and performs under the name Torres, is a complex, gritty, glorious album. The rawness of her singing and songwriting is heartrending, her ferocity bleeding through the sorrow, her sound both stark and rich. Scott investigates the darkness of grief and mental illness with smart, penetrating, often mournful lyrics, as on “Ferris Wheel”: “There’s nothing in this world I wouldn’t do / To show you that I’ve got the sadness too.”

Scott also sings of marijuana: “Blew my per diem / On an eighth of Blue Dream,” she bemoans in “The Exchange.” Raised in Macon, GA, Scott didn’t encounter weed until she went to college in Nashville. The first

time she smoked, “I didn’t get high,” she says. “I tried a few times, with a friend. I was pretty sheltered growing up, so it was kind of a big deal for me. I waited until I was in what I felt like was a really safe space, and I tried several times, but it didn’t work.”

She persevered, though. “The first time I actually got stoned, I got a joint for my friend for her birthday. We passed it around on her front porch, and it just ... happened.” Scott had a major panic attack—“I thought I was dying,” she recalls—and didn’t smoke weed again for a while. But now she prefers it to drinking: “I’ve been pretty consistently perma-stoned,” she confides with a grin.

Her rueful songwriting notwithstanding, Scott has a healthy sense of humor. She

describes the English seaside town of Bridport, where she recorded *Sprinter* last year with veteran producer Rob Ellis (PJ Harvey’s *Dry*), as a “retirement town for hippies.” But she was shocked to discover that despite the old-hippie vibe, “There was no marijuana to be found in Dorset. Two and a half weeks of recording, and nothing. I asked a lot of people—I asked the label! They came back and were like, ‘Sorry, we couldn’t find any.’ So there was a lot of Scotch involved for a couple of weeks.”

Scott feels that “it’s important to detach the stigma from marijuana,” adding: “It’s been very helpful to me.” She smokes when she’s writing and composing, but not when she performs. “I just find that it has a lot of the same effect that alcohol has on me, at a certain point. My fingers stop working. I forget lyrics. I try to be sober when I perform on all fronts. But when I write, I smoke.”

With her dark vitality, wry intellect and scorching talent, Mackenzie Scott—a.k.a. Torres—is poised to join the ranks of iconic rock powerhouses like PJ Harvey, Nick Cave and Kurt Cobain. Watch out for her—she’s going to blaze. ✨

Visit [torrestorrestorres.com](http://torrestorrestorres.com).



## She Got the Funk

What does Scott listen to when she’s smoking and writing? “A lot of Funkadelic,” she says. “I’m a late bloomer—I didn’t discover Funkadelic until last year. I thought it was the coolest thing I’d ever heard when I discovered it.”



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An apple  
toke a day  
ensures  
the band  
will play.

# Masters Of Weed Metal

North Carolina's Weedeater find themselves smoking out of apples a lot. *By J. Bennett*

**Ask Weedeater vocalist/bassist** “Dixie” Dave Collins about his band’s latest album, *Goliathan*, and he’ll tell you this: “It was written stoned and performed stoned—at least by me. And it would help if the listener is stoned.”

Weedeater was formed in the late 1990s in Wilmington, NC, after Collins’s old band, revered sludge lords Buzzov\*en, went tits up. The new band’s moniker developed as a bizarre double-entendre of sorts: “There was a situation where my dog ate all of my weed, so that’s where the name comes from,” Collins laughs. “At the same time, some of our early material didn’t sound unlike an actual weed-eater.”

Over the course of nearly two decades, Weedeater have unleashed such memorably

titled albums as *...And Justice for Y’all* and *God Luck and Good Speed*. Though their music is routinely described as “stoner rock,” they prefer the term “weed metal.”

“It’s a term that we coined, so we’re the only weed-metal band on the planet,” Collins explains. “But I don’t mind what people call us, as long as they’re interested enough to check it out.”

As for his personal ingestion, Collins remembers his first experience fondly. At 14, he and a friend fashioned a makeshift pipe out of a toilet-paper roll and tin foil and proceeded to hotbox his mom’s bathroom. “Then we ate everything in the house,” he laughs. “And I fell in love with it. It would be my drug of choice, but I don’t even consider it a drug.”

These days, Collins is a daily toker who partakes via his vaporizer or the custom bubbler that he bought for his girlfriend. “Since we live together, it’s one of those gifts that’s also for myself,” he concedes. “So I guess it’s kind of a con.”

Of course, crossing state lines and international borders precludes carrying glassware, so Collins and his bandmates—guitarist Dave “Shep” Shepherd and drummer Travis “T-Boogie” Owen—find that an apple a day keeps law enforcement away. “We

**“It was written stoned and performed stoned—at least by me. And it would help if the listener is stoned.”**

Smoke out of a lot of apples,” Collins laughs. “We’re definitely experts at this point.”

And though he’s been busted for possession in Europe, he’s managed to avoid serious jail time. “They’ll hold you at the police station for like 4 hours, and then they’ll let you go,” Collins explains. “You might miss a show, which is terrible, but they don’t have the draconian drug laws we have. Hopefully, that’ll change soon here.”

Sadly, Collins’s home state of North Carolina probably won’t be legalizing it anytime soon: In March, a legislative committee shot down a proposed measure that would have allowed medical marijuana. “It’s weird, because I consider us a pretty progressive state,” Collins says. “And the state stands to make a lot of revenue from it, because we’ve got great shit coming out of the mountains here. So I don’t know what the hell they’re thinking.”

Adding to their stoner cred, Weedeater recently collaborated with Outer Limits Hot Sauce, lending their name to the company’s jalapeno-and-hemp-seed condiment. “Man, we sold about 250 bottles of it in 27 days on our last tour,” Collins enthuses. “It’s delicious stuff. The hemp seeds give it a kind of smoky flavor. Even if you don’t like the band, I bet you’ll like the sauce.” ✨



### The Real Deal

Collins is so committed to the stoner lifestyle that he works at a headshop when he’s not on the road. “I’ve worked there for 12 years,” he says. “I haven’t been there much lately because I’ve been so busy, but I’ll be back, because I just love working there.”



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## Faith Resurrected

A welcome return from the masters of the real thing.

**Everybody's doing it:** Bands that hit their apex—and went tits up—in the '90s have been returning in force. Soundgarden, Pixies, My Bloody Valentine—the list goes on (and on), and the results are wildly varied. Recapturing the energy and artistic spirit of one's youth isn't always easy when one hovers around 50. And yet Faith No More have done just that with *Sol Invictus*, their first album in nearly two decades. Not that anyone should be surprised: FNM were easily one of the most talented and unclassifiable bands of the 20th century, and their breakup seemed more like an escape from the music industry's daily grind than any kind of creative capitulation—despite what misguided critics might say about their 1997 swansong, *Album of the Year*.



**Faith No More**  
*Sol Invictus*  
(Reclamation/Ipecac)

Faith No More's 2015 lineup is 1997 revisited: vocal contortionist Mike Patton, bassist/producer Billy Gould, guitarist Jon Hudson, drummer Mike Bordin and keyboardist Roddy Bottum. The latter's piano melodies take the lead on much of *Sol Invictus*, steering the mellow title track, playing romantic foil to Hudson's porno-funk guitar on "Sunny Side Up" and offsetting Patton's creepy falsetto on "Separation Anxiety." Then there's the metallic chug, cheerleader-style chants and anthemic chorus of "Superhero," a song that would have fit seamlessly on 1989's *The Real Thing* or 1992's *Angel Dust*, both widely regarded as FNM's finest hours. On "Cone of Shame" and "Rise and the Fall," Patton and Hudson vault into the spotlight with stellar performances, while Bottum lends a husky lead vocal to the comic kiss-off track "Motherfucker." All told, it's a one-of-a-kind return from an equally singular band. *J. Bennett*

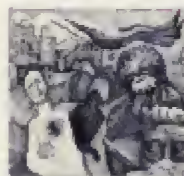
## MUSIC RECOMMENDATIONS



**Major Lazer**  
*Peace Is the Mission*  
(Mad Decent)

DJ/producer Diplo's third full-length as Major Lazer is a masterfully market-surveyed EDM missive that musters some wickedly varied new dance hybrids, though mega-hit "Lean On" plays it safe with a heavily auto-tuned vocal and a standard anthem-like chorus. High-steppin' bumpa-thump

"Too Original" interstitches foxtrot and ragga/klezmer clash; when "Blaze Up the Fire" brings Chronixx toastin' stylee over a candy shop of hyper-distracted mixtape madness like mechanical flies nipping at your face, the sheer volume of ticklish aggro-beauty is deliciously overwhelming. *John Payne*



**mewithoutYou**  
*Pale Horses*  
(Run for Cover Records)

Philadelphia quintet mewithoutYou routinely challenges critique and category, as on their sixth LP. Raw neo-punk energy is wrapped in a cocoon of geek literacy, while rhythm and distortion get weathered by waves of pinched psych, as on "Watermelon Ascot" and "Mexican War Streets."

Aaron Weiss's speak/sing/scream vocalizing tempers his verbose lyricism (including the Old Testament references in "Red Cow"). Teleporting closer "Rainbow Signs" burns a slow fuse before the contrasting guitars explode into rage and eventually subside into fuzzy acceptance. *Mark Miller*

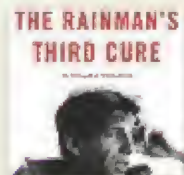


**Sufjan Stevens**  
*Carrie & Lowell*  
(Asthmatic Kitty)

Sufjan Stevens's seventh studio album is a folksy meditation on loss and family inspired by the real-life death of his mother, Carrie; it is also one of the strongest albums of 2015. Stevens employs the lyrical specificity, thematic depth and ornate orchestrations that listeners love—but now,

there's a sense of grounded maturity as he explores deeply personal existential questions. "What's the point of singing songs, if they'll never even hear you?" he asks on the bittersweet "Eugene." He lets the question hang as a challenge, and he expects you to consider an answer. *Ira Gamerman*

## BOOK RECOMMENDATIONS



**The Rainman's Third Cure**  
*Peter Coyote*  
(Counterpoint)

Best known as an actor, and as co-founder of the performance-art street commune the Diggers, Peter Coyote is the author of an earlier memoir (*Sleeping Where I Fall*), the best insider's account of 1960s freak theory in action. This worthy follow-up focuses on his lifelong spiritual influences,

a group that includes not just Zen Beat poet Gary Snyder but also a jazz bassist, a gay dancer from Martha Graham's troupe and a Mafia consigliere. The lesson is that with open eyes and heart—and sanctimony in abeyance—wisdom can be gleaned from unexpected sources. *Michael Simmons*

## DVD RECOMMENDATIONS

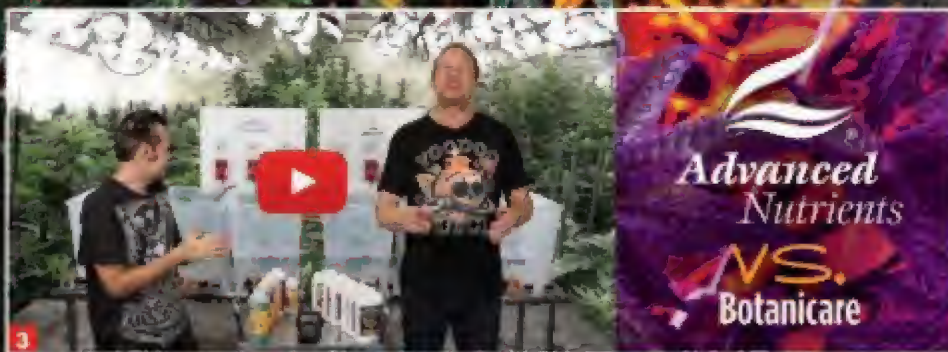


**My Side**  
*Directed by John Ridley*  
(Open Road Films)

Redoubtable screenwriter John Ridley (*12 Years a Slave*) writes and directs this biopic exploring the year in which Jimi Hendrix was catapulted from obscurity to international fame. André Benjamin skillfully captures Hendrix's rambling profundities and languid physicality. Glaringly absent

from the film are Hendrix's original songs, but Benjamin and guitarist Waddy Wachtel effectively use blues standards to re-create the feel of the legendary guitarist's work. Providing a fascinating window into a specific time, the film closes as Jimi departs for Monterey and rock immortality. *Fritz Meier*

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## MUNCHIES

### Om Oatmeal

Nourish yourself with this recipe for a hot, healthy and highly nutritious cereal.

As the California cannabis industry expands and matures, more patients are seeking healthy cannabis-infused food options, including several that won big at the recent High Times Cannabis Cup in San Francisco. Maya Lapid, the founder of Om Edibles, scored a first-place win with her Raw CBD Sipping Cacao, as well as a third-place win with her Cinnamon Maple Tree Hugger Coated Nuts. “I predicted this year was about superfoods!” Maya exclaims. “I wanted to make something healthy and delicious, gluten-free and vegan, that had a long shelf life.”

Cannabis, as we all know, is a positive, life-affirming substance with many medicinal benefits, so it makes sense to combine it with foods that contribute to an overall feeling of vitality. “Superfoods,” which include whole foods like kale, hemp, salmon, blueberries and cacao, are nutrient-dense and packed with important vitamins and minerals. Noting that more patients have been seeking out these healthy options, Maya says: “Once people see how each ingredient contributes an important benefit, they’re much more likely to try it.”

For example, check out the ingredients in the recipe

below. Oatmeal is high in soluble fiber, which lowers harmful cholesterol and leaves you with a feeling of satisfied fullness for many hours. Coconut oil is full of healthy fats that help your body eliminate toxins while also improving cell and brain

function. Both chia seeds and hemp seeds are nutrient-dense superfoods that contain omega 3 and 6 fatty acids, vitamins, minerals, protein and fiber. Chia seeds are also hydrophilic, absorbing water and helping to hydrate your body. Raw honey strengthens your immune system, provides quick energy, and has a unique blend of vitamins, minerals, enzymes, antioxidants and phytonutrients. (A vegan alternative would be maple syrup.) Sea salt is rich in minerals and trace nutrients, while cinnamon helps with circulation, is packed with antioxidants, and has antimicrobial properties.

So for a warm winter breakfast, try a quick and nourishing bowl of cannabis-infused superfood that will comfort you throughout the day! *Elise McDonough*

#### OM OATMEAL

- 1/4 tsp. sea salt
- 2 cups quick-cooking oats
- 4 tbsp. coconut oil (preferably raw and organic), infused with either THC or CBD
- 4 tbsp. chia seeds
- 4 tbsp. hemp seeds or hemp hearts
- 2 tsp. cinnamon
- 2 tbsp. raw honey

In a medium saucepan, bring four cups of water and a quarter-teaspoon of sea salt to a boil. Stir in two cups of oats. Reduce heat and simmer, uncovered, for one minute, stirring occasionally.

Remove the oatmeal from heat, add in all of the other ingredients and stir. Enjoy in good health! *Medicates 4.*



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## Maple Bacon Bourbon Butter Sauce

### Ingredients

Skill level: Easy  
Prep time: 10 minutes

Cook time: 15 minutes  
Serving size: 2 tablespoons/30 ml  
Yield: About 2 cups/480 ml

- 6 tablespoons/90 ml MagicalButter
- 12 ounces/360 ml pure dark amber maple syrup
- 10 strips bacon, sliced crosswise into 1/4 inch wide strips
- 3 ounces/90 ml Maker's Mark bourbon
- 2 tablespoons/30 ml organic cane sugar
- 1 tablespoon/15 ml vanilla paste


### How to

1. In a large sauté pan on medium heat, cook the bacon until halfway done, about 5 minutes.
2. Drain the bacon on paper towels to remove excess grease, discard the fat from the pan, and return the meat to heat.
3. Add butter, and cook until the bacon is crispy; then add sugar and vanilla paste, and cook for 1-2 minutes.
4. Add 2 ounces/60 ml of bourbon, and cook for 1-2 minutes.
5. Add maple syrup, and cook for an additional 5 minutes.
6. Stir in the remainder of the bourbon, remove from heat, and decant into a syrup pitcher or serving dish.

Find recipes at [magicalbutter.com/recipes](http://magicalbutter.com/recipes), and watch how-to videos at [youtube.com/herbalbutter](http://youtube.com/herbalbutter).

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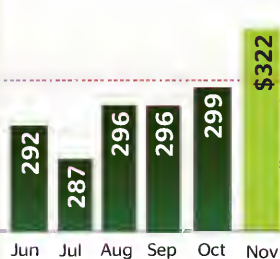
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**MARKET ANALYSIS**

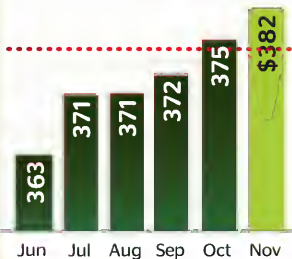
*Prices by the ounce*

Index Watch: After five months of wild fluctuation the Mids Index held steady in November and closed the month within \$3 of its year-to-date average. The US Price Index experienced the biggest gain, finishing \$23 above its previous month's average. Kush, Diesel and Blue Dream were the top submitted strains for the third consecutive month.

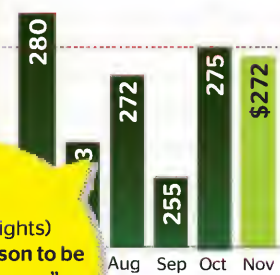
**US Price Index**  
 YTD Average: \$300



**Kind Index**  
 YTD Average: \$372



**Mids Index**  
 YTD Average: \$275



**Schwag Index**  
 YTD Average: \$102



(Northern Lights)  
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 -Mason City, IA

**TRANS HIGH MARKET QUOTATIONS**

STATE	CITY	STRAIN	PRICE
Alabama	Birmingham	Silver Haze	\$350
Arizona	Phoenix	Grand Daddy Purps	275
Arkansas	Little Rock	Mazar	380
California	Lodi Los Angeles	Girl Scout Cookies Platinum Kush	200 300
Colorado	Denver Pueblo	Golden Goat Headband	260 220
Connecticut	Hartford	Blue Dream	350
Delaware	Wilmington	East Coast Sour Diesel	360
Florida	Orlando	Purple Kush	400
Georgia	Atlanta	Diesel	330
Hawaii	Maui	Tahoe OG	340
Illinois	Chicago	Master Kush	400
Indiana	Indianapolis	God's Gift	260
Iowa	Mason City	Northern Lights	450
Kentucky	Fort Campbell	Sensi Star	380
Louisiana	New Orleans	Headband	420
Maine	Portland	Sour Diesel	320
Maryland	Baltimore	Chemdog	375
Massachusetts	Boston	Kosher Kush	350
Michigan	Traverse City	Blue Dream	280
Minnesota	Minneapolis	Casey Jones	350
Missouri	St. Louis	Bubblegum	350
Montana	Helena	Lowryder	250
Nevada	Las Vegas	Blue Dream	320
New Hampshire	Concord	Jillybean	360
New Jersey	Hoboken	Skywalker OG	380
New York	Brooklyn	Strawberry Cough	400
North Carolina	Raleigh	Star Bud	380
Ohio	Columbus	Girl Scout Cookies	375
Tennessee	Nashville	Chemdog	450
Texas	Austin	Space Queen	400
Washington	Spokane	Cheese	180
Wisconsin	Milwaukee	Blue Dream	320
INTERNATIONAL			
Canada	Toronto Victoria	Jack Herer Ghost Train Haze #1	C\$200 180
United Kingdom	Liverpool London	Cheese Strawberry Diesel	£160 220

High Times wants to know what you're smoking. Submit your strain information including location and price by the ounce to [thmq@hightimes.com](mailto:thmq@hightimes.com), or tweet us (#THMQ).

(Space Queen)  
 "No joke... Out of this world."  
 -Austin, TX



1

2

3

4

# Hot Products

What's new for cannabis cultivators and connoisseurs.

## 1 Vapor Trail

\$149.99

[vapium.com](http://vapium.com)

Finding a quality vaporizer for flowers isn't easy, so we're excited about the Summit, a new handheld unit from Vapium. With eight temperature settings from 320°F to 450°F, this durable, easy-to-clean vape is versatile as well as sleek. The USB-chargeable lithium-ion battery is long-lasting, and the Summit vibrates when ready for use. Throw in a one-year warranty and you're good for at least 365 days of no-hassle vaping.

## 2 Mite & Mold Killer

\$15.86, 8 oz.; \$25.86, 32 oz.; \$75.86, 1 gal.

[norcalnutrients.com](http://norcalnutrients.com)

Growers are raving about the effectiveness of NorCal Nutrients' 86 against spider mites, powdery mildew and mold. Organic and food-grade safe, this easy-to-use spray is made with natural oils, but it's deadly for pests and diseases. Simply apply 86 once a week to the tops and undersides of your leaves and let them dry out during the dark cycle.

## 3 Gas Act

\$39.99, Enhancer; \$24.99, refill pack

[tnbnaturals.com](http://tnbnaturals.com)

Indoor growers know that adding carbon dioxide can boost yields substantially, but not every indoor grower can afford their own CO<sub>2</sub> tank or generator. Now, even small-scale farmers can organically enlarge their plants using the Enhancer CO<sub>2</sub> dispersal canister. All you need to do is add warm water and shake—plus the handy refill packs mean that you can reuse these canisters again.

## 4 Clean Air

\$19.99, filter; \$8.99, filter cartridge

[sploofybrand.com](http://sploofybrand.com)

Shakespeare famously wrote that “the better part of valor, is discretion”—and stoners know this better than most. So the next time you need to take discreetly, instead of breaking out the dryer sheets and toilet-paper roll, try the Sploofy, a three-piece HEPA filtration system. Simply blow smoke through the filter, and the activated coconut carbon traps odors inside the unit.





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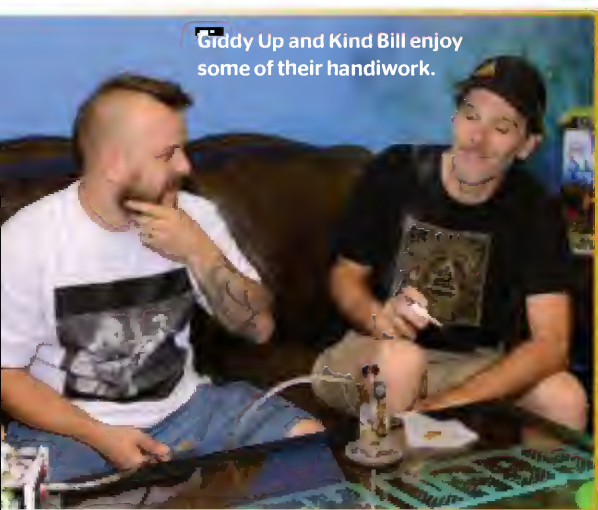


Big Poppa OG live resin

# IT'S ALIVE!



The Origins of Live Resin



Giddy Up and Kind Bill enjoy some of their handiwork.

## Dabs have become more delicious than ever thanks to the fresh and flavorful new type of BHO known as “live resin.” Story & Photos by Ry Prichard

medical marijuana became legal in Colorado, Fenger returned home and began working as a master grower at several large facilities—even starting the first legal grow dedicated exclusively to concentrate production in 2010. It was around this time, while tending these medical gardens, that he had a flash of inspiration.

“As I would trim my harvests,” Fenger recalls, “I always thought, ‘How cool would it be to be smoking oil from this plant while I’m doing this?’ The smell of the plants when they’re still alive, or while they’re being trimmed, is so intoxicating compared to dried buds... that’s what I wanted in an extract.”

Given that up to 95 percent of a plant’s terpenes can be lost from harvest through the final curing process, Fenger decided to try something new. Seeking to produce a concentrate with the terpene profile and pungency of a plant fresh from the garden—and taking a leaf from the method of creating fresh-frozen water hash (which generally makes a better product than dried material)—he tried processing a batch of butane hash oil not from dried buds or trim, but from a freshly harvested, flash-frozen

whole plant. The result was a new type of cannabis concentrate that Kind Bill later dubbed live resin.

For the record, this idea wasn’t entirely new: A few others had also attempted making “fresh-frozen” BHO as early as 2011—but they were all using the open-blasting method, with less than satisfactory results.

“The first batch I ever made was from Original Diesel”—a rare Florida cut—“and everyone I showed it to was blown away,” Fenger remembers. “The flavor, smell and effect were amazing to me; it was the best thing I had ever smoked at that time. But the appearance got a lot of flack, the yield was terrible, and it was dangerous—so, ultimately, I rarely did it.”

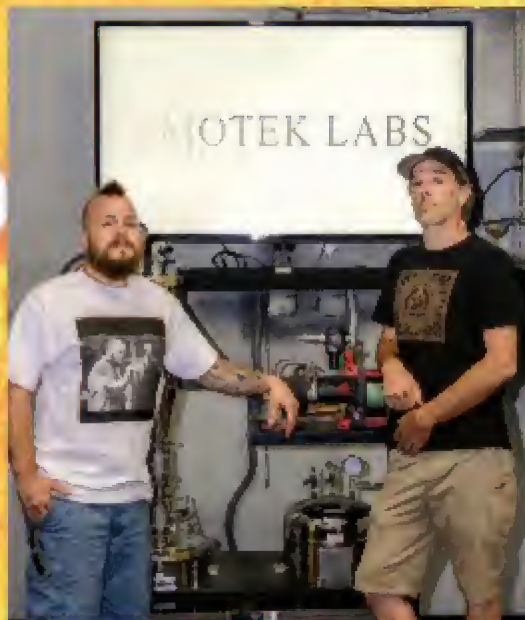
There were several challenges involved in trying to open-blast live resin. For one thing, freezing the extraction tube made the glass fragile and prone to shattering. This led some blasters to make questionable substitutions—such as using a frozen, drilled-out Thermos rather than a glass tube. Though tweaks like this theoretically made the process slightly safer, they were far from satisfactory for any kind of reliable, large scale production.



There are times when a perfect fusion of circumstances leads to the creation of something entirely new—something that changes the conversation altogether.

Such was the case in the fall of 2013, when an inspired grower and hash-maker named William “Kind Bill” Fenger and an intrepid entrepreneur named Giddy Up joined forces and made hash history.

Kind Bill is something of an unsung hero in the concentrate community. Originally from Colorado, he began growing cannabis and making hash while living in Florida in the late 1980s, and he’s since produced hundreds of pounds using a variety of methods in numerous locales. In 2000, when



Top left: An Ultra Sonja plant is earmarked for live resin. Bottom left: Frozen Ultra Sonja plants being harvested. Above: Giddy Up and Bill with the extractor that made live resin possible. Right: The tank and column also are frozen while running live resin.



Another problem: If the glass actually survived the extraction process without blowing out, the resulting concentrate was often too green and harsh. The color was due to chlorophyll, which was drawn out along with the terpenes and cannabinoids as the plant material thawed during the slow extraction process. This melting posed yet another problem: Moisture, also drawn from the thawing plant material, led to a finished product that snapped and crackled in a way that most devoted dabbers found unappealing.

And to top it all off, the yields simply weren't there. Stuffing a glass tube with frozen material (which takes up much more space than the dried stuff) typically yielded less than a gram of finished oil, leading most hash-makers to conclude that fresh-frozen BHO would never become a viable commercial product.

Nevertheless, the mental seeds were planted with Fenger's first batch. It wouldn't be until two years later, however—after he met EmoTek Labs founder Giddy Up in September 2013—that they finally grew to fruition.

It all started at the Colorado Springs production facility for the medical dispensary A Cut Above, where Giddy had recently placed one of his early OBE-Dos closed-loop extraction units to produce wax and shatter. The staff was struggling to produce a high-quality product with the new machine,

and so Kind Bill (by this time a nationwide extract consultant) was brought in to help resolve the production issues.

When he was introduced to Giddy Up and his shiny steel, large-capacity extractor, Fenger knew instantly that this was the paradigm shift he'd been waiting for.

"When Giddy told me that the OBE-Dos unit was pressure-rated down to  $-10^{\circ}\text{f}$ , I was incredibly excited," Bill recalls. "I immediately knew I could do new things with this unit that weren't possible with glass tubes... I knew that this was the machine that would be able to make what would become live resin."

The duo put their heads together and began experiments with the unit. The first batch of live resin they attempted was a mix of Chem Dog, Chem #4, and Big Poppa OG trim. Unfortunately, they ended up over-vacuuming it in post-processing, and the batch lost much of its sought-after qualities. It wasn't until about a month later, during a late-night oil-making session with a group of fellow extract artists and connoisseurs in the kitchen of Gaia's Garden, that they made the first truly successful batch of live resin—using frozen whole plants of Tres Star from Top Dawg Seeds, grown by Tierra Rojo and his team at Gaia Plant-Based Medicine (now known as MiNDFUL). The group ran several more strains over the next 24 hours, including East Coast Panama Chunk, Chem D and DJ Short's Flo. It was during this extraction marathon that Bill first coined the term "live resin."

Without question, live resin has become the hottest concentrate on the market right now. Since its creation in Colorado, it has quickly won multiple Cannabis Cups and other concentrate competitions, and it's now available in many medical states in one form or another. Its uniquely pungent smell and flavor are the main attraction, but many extract aficionados are also drawn to the near-luminescent color that is common in well-made live resin (which practically glows when it's made from A-plus material).

The most common criticism of live resin is that it has a less stable consistency than shatter made from dry plants, which can cause the BHO to transform quite a bit over time: from a shattery or sappy oil to a slightly cloudy, more granular "sugar" texture, then finally to a soft, sandy consistency that is mostly dry to the touch. These differences in appearance and texture are due to the higher moisture and terpene content.

The shatter consistency is the most stable, but it's also the toughest to attain for most extract artists, since it requires A-plus starting material as well as extremely cold temperatures (or secondary dewaxing) to maintain its stability. Like traditional shatter/sap, the aroma isn't as noticeable as in the other textures, but it tends to retain its terpenes the longest (when properly stored).



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Freshly extracted Sour Diesel Deep Chunk (S.D.D.C.) live resin in collection basin

The sugar consistency is granular in texture, as mentioned earlier, and comes most often from a long, strong, warm vacuum purge. Sugar is extremely terpene-rich and pungent when fresh, but it tends to lose those qualities more quickly than the other textures.

Much like standard BHO, live resin can also be whipped over heat into a gorgeous light-colored wax/budder, which results in either a soft, pliable product or a dry, crumbly one. Both of these smell incredible, but tend to lose their pungency more quickly than the unwhipped shatter/sap.

Of course, these texture changes depend greatly on the storage methods used, the time elapsed and, most importantly, the plants and strains used in the extraction. Some plants produce a very stable shatter-like resin that stays perfectly clear and breaks when tapped, while others produce a liquidy oil so rich with terpenes that it's impossible to turn into anything else. In any case, since the volatile, water-soluble terpenes begin evaporating from the moment a batch is produced (even visibly separating and leaking into the container), live resin must be stored properly—or, better yet, consumed quickly.



S.D.D.C. live resin on parchment ready for the oven

Getting a perfectly stable live resin is primarily a process of trial and error that involves experimenting with a variety of strains, oven temperatures and pressures. However, here are some key variables to keep in mind that can help produce and preserve a top-notch product free of chlorophyll, moisture and most lipids:

**1) Run the material as fast and as cold as possible.** A very quick, cold extraction process prevents the material from thawing out, which is the most common reason for harsh, green-tinted oil.

**2) Freeze the column.** Keeping the steel column extremely cold keeps the material inside as cold as the butane, making the whole process much cleaner. (Please note that this step depends on the closed-loop extractor being used, as some are

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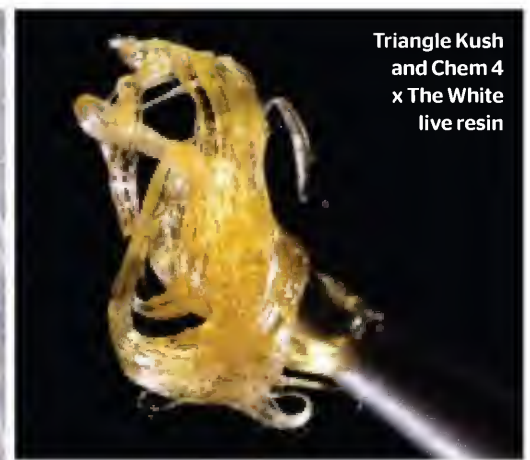
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unsuitable for such low temperatures, and the extreme cold may cause seals or clamps to rupture.)

**3) Use only top-quality frozen whole plants rather than trim.** Though it's possible to get a decent-quality live resin from well-maintained trim, the very process of slicing into the plant with scissors creates openings that allow more chlorophyll to leach out during the extraction. If the plant is harvested quickly (with most of the guard leaves left on), this allows it to get into the freezer much sooner—locking in as much chlorophyll as possible and resulting in less terpene loss.

**4) Store live resin in a wine cooler or refrigerator to maintain the texture for as long as possible.** The cool, low-humidity environment of a wine cooler presents the ideal conditions for curing and storing live resin. Aside from significantly slowing (or altogether stopping) the nucleation (autobuddering) process that it usually undergoes, keeping live resin in cold storage for months can produce a more interesting, pungent product (much like curing dried flowers or aging wine).

In the years since he and Giddy Up whipped up those first batches in Colorado, Kind Bill has watched dozens of other

extract artists start making live resin—many times with methods different from the one he pioneered. But he doesn't seem to mind: Unlike many concentrate producers, who hoard their techniques to the detriment of the cannabis community at large, Fenger has an open-source mentality that sets him apart.

"I'm just glad that the tech is getting out there, because that means more live resins for everyone—and that's a good thing for the universe, as far as I'm concerned," he says. "I love seeing the progression of this industry, and I look forward to the time when I can smoke something new that makes me forget all about live resin. That's the special magic that keeps me doing this, and keeps me excited about the future of concentrates." ✨

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# The Laws of Extraction

While more and more states are legalizing or decriminalizing cannabis, most are not quite so progressive when it comes to concentrates.

By Rezwan Khan, JD

**M**uch like the years leading up to the historic fall of the Berlin Wall, the walls of marijuana prohibition in the United States are systematically being chipped away—brick by brick, state by state. Today, almost 20 years after California’s first medical marijuana initiative passed in 1996, we’re living with a complicated, often-ambiguous patchwork of marijuana laws that seems to bring more confusion than clarity to this hot-button issue. And that goes double for concentrates.

As public support for legalizing and regulating cannabis (both medical and recreational) continues to rise, so does the demand for concentrates. It’s estimated that in just the first year of legal recreational marijuana in Colorado and Washington, concentrates made up 40 to 60 percent of the sales in these states. However, despite their popularity, concentrates continue to be a polarizing topic, for a variety of reasons.

First, the debate continues over the best extraction methods and how they affect the end product’s potency, consistency, utility and safety. While some still fear negative health effects from ingesting residual butane, the science thus far shows this concern to be unfounded: Pharmaceutical-grade hydrocarbon solvents have a low toxicity, which is why the Food and Drug Administration currently allows up to 5,000 ppm (parts per million) in goods sold to the public. In legal cannabis markets, lab tests have consistently shown that the average level found in concentrates is zero to 300 ppm.

There is also the public-relations problem: It’s no secret that smoking dabs through an oil rig, especially when using a blowtorch, looks a little too similar to freebasing crack. Even more worrisome than the “cracky” aesthetics of dabbing, however, are the backyard extractors doing sketchy runs at home—with



dangerous and potentially explosive results. As a result, the media have been quick to sensationalize and even demonize the process of cannabis extraction. This divisive debate—with one side asserting that concentrates are unhealthy and potentially dangerous, and the other side insisting that they’re the best thing to happen since penicillin—is reflected by the vast disparity in the “laws of extraction,” or the regulations and penalties covering the manufacture, possession and use of concentrates in all 50 states.

On the one hand are those states that treat cannabis concentrates like the devil’s drip, doling out maximum penalties for minimum offenses. In Mississippi, for example, anything over 0.01 of a gram is an automatic felony carrying a mandatory two-year sentence. (Just for scale, 0.01 of a gram is less than the reclaim currently in your rig.) And in Oklahoma, manufacturing or distributing any form of hash can land you in prison for life. A *life sentence*, for just a few dabs. Let that one sink in for a minute.

On the other end of the spectrum are the “pro-oil” states, which seem to be headed in a far saner direction. One example is Colorado, which has adopted a two-pronged approach. For licensed professional extractors, the state has implemented a sensible, progressive regulation system, including certifications to

ensure the safety and quality of concentrate production. For amateur blasters, however, the state has made unlicensed, at-home blasting a Class 2 felony. Another interesting example is Georgia, which has legalized possession of up to 20 ounces of oil for medicinal use.

To further complicate the landscape, 15 states have now passed “CBD-only” legislation—providing for the medicinal use of concentrates high in CBD, but with little to no THC. The problem with initiatives like these is that they fail to understand the efficacy of whole-plant marijuana as a medicine (especially the so-called “entourage effect”) and thus allow only extremely limited applications instead of moving us toward a broader solution.

Take Gregg Abbott, the Republican governor of Texas: After vowing that the state would never legalize cannabis for recreational or medical use on his watch, Abbott then signed a narrowly drafted bill that provides for the legal use of CBD oil to treat epilepsy. Not AIDS, not glaucoma, not cancer—*only epilepsy*. Legislation like this seems more like a quick political fix than a long-term practical solution, and it forces one to wonder whether these lawmakers used any logic or conducted any research at all, or if they just based the language of their proposed legislation on sound bites from Dr. Sanjay Gupta’s CNN specials.



Some of the evidence confiscated by the DEA as a result of their Operation Shattered Dreams raids

Finally, there's the bellwether state of California, which opened the door to medical marijuana in the first place and arguably produces more BHO than any other state. Even so, California is still without any comprehensive legislation covering concentrates. Last December, an appellate court finally clarified that possession of concentrates is protected under the state's Compassionate Use Act and medical marijuana laws. But without any legislation in place, creative prosecutors have resorted to exploiting antiquated laws covering PCP and methamphetamine production to prosecute legitimate concentrate-makers.

Case in point: On September 16, 2014, after a year of investigation (including the monitoring of Instagram pages), the DEA launched Operation Shattered Dreams—raiding, among other locations, an alleged “clandestine THC extraction

**In Oklahoma, manufacturing or distributing any form of hash can land you in prison for life. A life sentence, for just a few dabs. Let that one sink in for a minute.**

laboratory” at the San Diego home of Matthew Darby (a.k.a. “Dr. Darby” of Top Shelf Life), a well-known figure in the cannabis community. Darby was charged under the California Health and Safety Code's Section 11379.6, which was drafted to root out meth and PCP manufacturing in the 1980s. Under this statute, it remains a felony to manufacture *any* amount of concentrated cannabis using a chemical-extraction process. (I've even seen particularly aggressive prosecutors

make the absurd argument that since H<sub>2</sub>O is a chemical in the extraction process, its use should warrant the same penalty.) As a result, Darby faced the possibility of up to *seven years* in state prison for what he believed was the lawful production of medicine under California law. Fortunately, thanks to attorney Nathan Shaman, he ended up with probation and only a misdemeanor on his record.

Given such glaring disparities in marijuana laws across the country, we can only hope that extractors like Darby, who provide much-needed medicine for sick individuals, will continue to be brave enough to do so, and that lawmakers will eventually wake up and realize that they are not only criminalizing people for violating outdated and ambiguous cannabis laws, but also limiting the discovery of treatments for actual diseases.

While the full medicinal potential of concentrates has yet to be realized, we already know enough to conclude that they are the future of medical cannabis. The ability to grow strains high in CBD, THC, CBN, CBG and so forth, and then to extract their trichomes into a concentrate, enables doctors and caregivers to provide specific treatments for a variety of ailments (including epilepsy, glaucoma, depression, chronic pain, inflammatory

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disorders and even cancer). Moreover, these concentrates are free of fungus, mold, or bacteria and can be administered with pinpoint accuracy using a dialed-in delivery system that can be measured and regimented (more akin to what you might expect from a regulated, nutraceutical/pharma-grade product).

This high degree of precision, combined with its potential benefits, now has many researchers looking to the budding science of cannabis extraction as their primary focus. Early findings have piqued the interest of both legislators and the medical community, as researchers, scientists and patients continue to put pressure on state and federal lawmakers to lift the restrictions on concentrates, which have already proven their safety and efficacy far beyond many pharmaceuticals currently on the market.

We've already seen one major restriction removed this June, when the Obama administration eliminated the "public-health service review" heretofore required for the approval of research proposals involving marijuana. Hopefully, this continuing pressure will eventually lead to the reclassification of cannabis from Schedule I to something more palatable. Recently, the American Academy of Pediatrics requested the DEA to reschedule



## Researchers, scientists and patients continue to put pressure on state and federal lawmakers to lift the restrictions on concentrates.

marijuana in order to facilitate research into its medical use—and even the US surgeon general has questioned the appropriateness of retaining it as Schedule I drug. Rescheduling marijuana would not only remove the single biggest obstacle to scientific and medical research; it would also untie the hands of physicians and banking institutions that fear the current federal penalties.

Considering that the main opposition to ending pot prohibition has, historically, come from the right, it's highly likely that

with the thorough debunking of "reefer madness," we'll see significant change coming soon. We've already witnessed the beginnings of a bipartisan push to decriminalize marijuana on the federal level from Senators Kirsten Gillibrand (D-NY), Cory Booker (D-NJ) and Rand Paul (R-KY). And with more than half of the American electorate already residing in medical marijuana states, legalization may provide an unprecedented opportunity to win over new voters. Of course, this strategy hinges on educating the public enough to overcome 80 years of anti-pot propaganda. Ultimately, change will come as an older generation of lawmakers steps down or admits what the scientific community already knows: that concentrates are the most effective way to administer medical marijuana to patients in desperate need of a real solution.

So what is the legal future of cannabis concentrates in the United States? I'd say that, based on the medical implications—combined with the financial projections for what is estimated to become a \$10 billion industry in the next few years—it is inevitable that we will have the full legalization and regulation of cannabis concentrates for medical use by 2018.

As for recreational use, well ... we'll just have to wait and see. ✨

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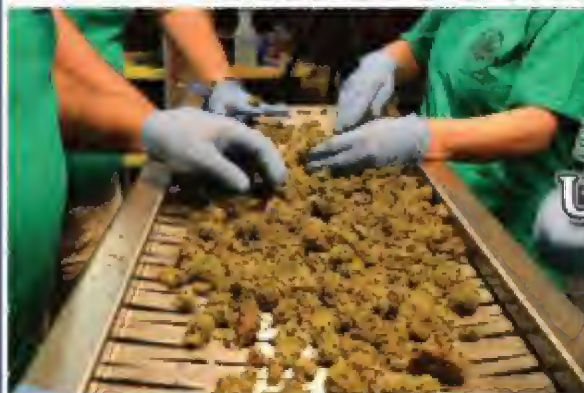
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# Electronic Nail Buyer's Guide

The editorial staff here at *High Times* gathered some of the top electronic nails on the market, put them to the test and rated them on a scale from one to five. Here's a breakdown of how they measured up.



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2	D-Nail	D-Nail 1.2 Kameleon Bundle	Digital 1.2 control station with Kameleon custom painted enclosure; SiC Nail on V1.2 base; flat coil heater; Gen 2 universal titanium carb cap with threaded rod handle; instruction manual	Compatible with all 14mm and 18mm female rigs, drop-downs, and adapters; Displays heater temperature (accurate to the degree) and can be programmed to the specific temperature of your choosing; two year warranty (upgradable to lifetime +\$100)	\$710	d-nail.com	<b>Pros:</b> sleek, discreet; cool holographic case; smart power setup (in/out on opposite ends of control unit); can hold down temp button <b>Cons:</b> slow to heat; temp calibration seems off <b>Rating:</b> 3.5
3	Electro Dabber	Electro Dabber	Titanium nail head; stainless steel heating element; smell-proof Pelican hard shell case; 45° and 90° angle adapters; 14mm/18mm adapter; stainless steel dab tool; 7ml acrylic container; 18v power transformer		\$225-\$350	facebook.com/pages/Electro-Dabber/145430092330387	<b>Pros:</b> no control unit—just a nail and a cord; heats fast; <b>Cons:</b> no temp meter or adjuster; wires became exposed during use; cable is not well insulated or sturdy; hit tasted like electrical components <b>Rating:</b> 1.9
4	Errlectric/Jibtronix Corp.	Errlectric Concentration Station E200 / E200-120	7.5' Power cord, heating coil, 5' whip, quartz fork tool, digital control station, Grade 2 titanium domeless nail, quartz nail head insert, heater stand; VotexCap titanium carb cap/dab tool; stainless steel heat shield; hard plastic travel case, titanium nail brush	Comes in black, white, pink or limited edition blue; automatic shut-off timer and auto high-temp shut off; full range of accessories sold separately; dab tool/carb cap available in many colors	\$479-\$695 (depending on options)	errlectric.com	<b>Pros:</b> auto-off timer; heavy, reinforced cord; hits well; excellent temp control/programmability; cool nail stand & tool; unique quartz nail head insert <b>Cons:</b> whistle while clearing the rig; small dabbing surface <b>Rating:</b> 4.06
5	Escape / Domeless	710 Whip	Ceramic universal flat coil nail by Domeless; ceramic heating element; ceramic carb cap; analog controller; soft zippered carrying case; tether strap	Available in seven different accent colors	\$145	domeless.com; 710.life	<b>Pros:</b> convenient, compact pouch; very portable <b>Cons:</b> bad smell/taste even after seasoning nail; no on/off indicator or temp gauge/control; bad insulation; exposed wires next to heating element; flimsy cable; carb cap hard to use <b>Rating:</b> 1.6



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**2nd Place**



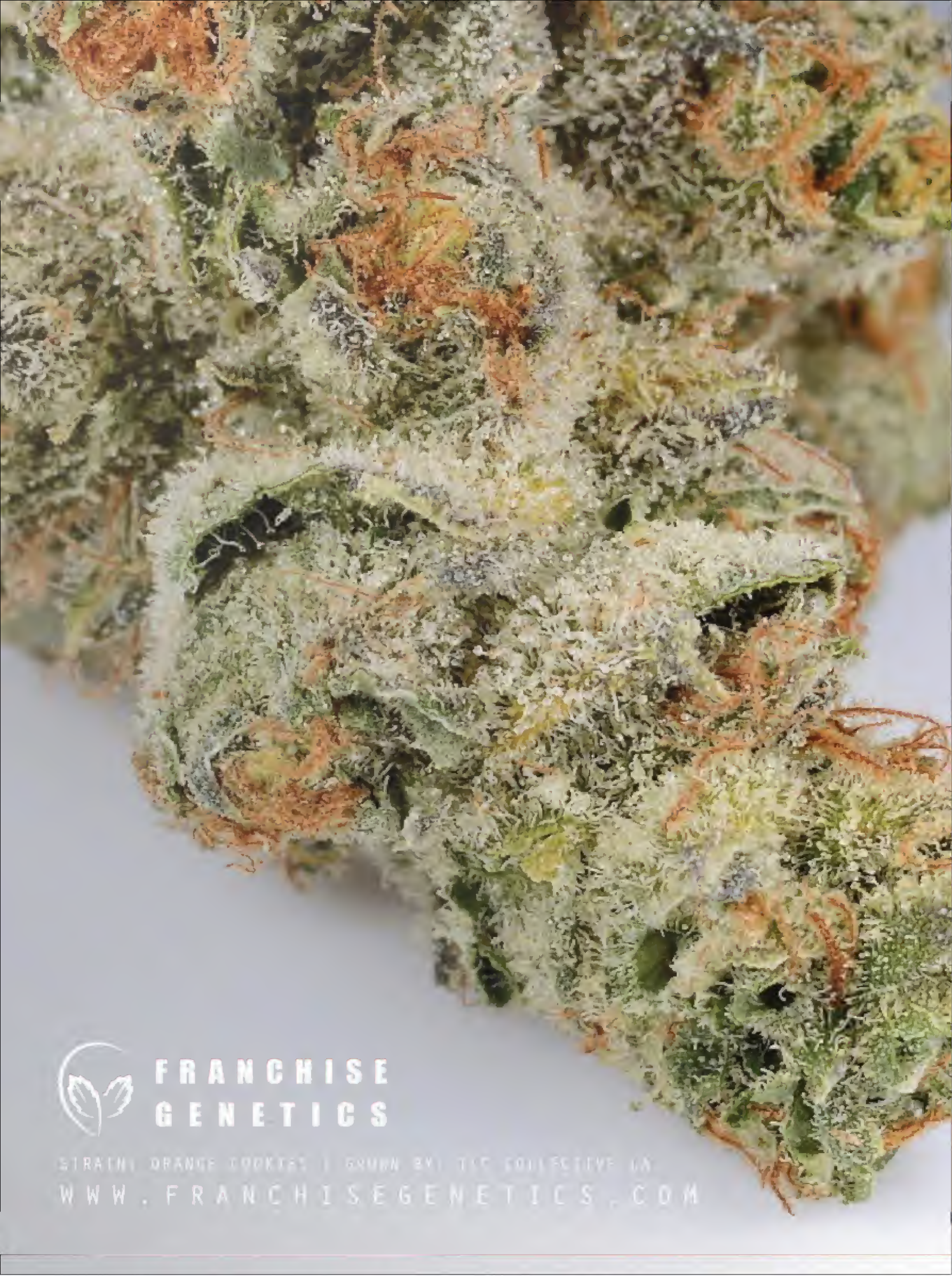
NO.	COMPANY	MODEL	INCLUDES	FEATURES / OPTIONS	PRICE	WEBSITE	REVIEW / RATING
6	Galaxy	Galaxy ENail	Launch Pad digital control unit; ceramic carb cap; titanium dab tool; ceramic 14/18mm female and male adapters; stainless steel heating unit with ceramic nail; power cord	The only quartz infused ceramic dish and all ceramic air pathway; three-year warranty against manufacturer defects, available in five colors; made in Santa Cruz, CA	\$399	<a href="http://galaxynails.com">galaxynails.com</a>	<b>Pros:</b> delivers big dabs; sleek, space age design; clear digital display and easy to use buttons; solid cord; steady base <b>Cons:</b> slow heat up; hard to clean out; smolders after repeated use; creates a foul smell <b>Rating:</b> 3.9
7	Happy Daddy	Analog D-Nail	Flat coil heating unit w/ fabric-coated whip; power cord w/in-line control dial; titanium dabber; Genesis nail (extra)	Also available in Digital model; available with or without proprietary Genesis Nail system	Analog: \$160; (Digital: \$450; (w/ Genesis nail +\$200)	<a href="http://happydaddyproducts.net">happydaddyproducts.net</a>	<b>Pros:</b> super smooth hits; in-line control unit; Genesis nail is solid; nice connector cord <b>Cons:</b> no on/off indicator or temp gauge; analog temp dial hard to tune to desired temp; oil drips into nail components causing smoke; heating element glowed red hot <b>Rating:</b> 2.3
8	Mi Dabz	Mi Dabz Enail Kit	Digital control station, 5' power cord; heater coil / whip; dab tool w/carb cap	Comes in your choice of eight different case colors and four display colors, and quartz or titanium nail (for \$40 extra); two-year warranty	\$260 (w/ti nail \$300)	<a href="http://midabz.com">midabz.com</a>	<b>Pros:</b> Durable, stylish control box (looks like a ballast); decent hit; heats super fast; reinforced wires; compact <b>Cons:</b> bad air/smoke ratio (too much airflow); heat unit exposed and red hot (dangerous) <b>Rating:</b> 3.2
9	Torchless Nail	Sour Apple Green Kit	Strap-on 1.5 amp battery pack; two borosilicate glass nails / heating element adapters (9mm male & 14mm female); two titanium elements (bowls); 30" fabric-coated heating cord; power / charger cord	99.6% Grade 2 titanium; rechargeable battery-powered electric bowl; glass bowl; 30 uses on every charge; straps to any 2-5" tube; heats to 500°F in two seconds; fits: 19mm female, 14 mm male; 30" heating cord; up to 1500 uses; battery allows 300+ charges	\$370	<a href="http://torchlessnail.com">torchlessnail.com</a>	<b>Pros:</b> push-button offers immediate heat on demand; very fast cool-down; cordless (after charging); super portable; great concept but needs work <b>Cons:</b> only stays on for 8 seconds; need a large tube rig for strap to work well; dabbing surface pops out of nail too easily; too much airflow; tastes metallic <b>Rating:</b> 2.6
10	Torchless Electronics	710 Pyromid	Pyromid digital control station; stainless steel whip / 16mm heating coil; power cord; Vapenwiser titanium nail	Three-year warranty	\$420	<a href="http://facebook.com/torchless">facebook.com/torchless</a>	<b>Pros:</b> sleek design, great indicators for power/juice to nail (can see current and desired temps simultaneously); long, sturdy steel cord; cool top logo light; stable and durable; big hits; good air flow <b>Cons:</b> a little bulky, not very portable <b>Rating:</b> 4.25
11	Yocan	Yocan Beta Portable E-Nail	Tiny metal battery/control box, plastic whip, large metal heating unit/nail, three Nero nail head heating elements	Heats to 1300°F within three seconds; universal male and female joint attachment; 510 threaded; compatible with all standard vape mods and batteries	\$149.95	<a href="http://yocantech.com">yocantech.com</a>	<b>Pros:</b> super portable; cordless (after charge); sleek design; unique digital display <b>Cons:</b> not satisfying hits; no cord enclosed to charge unit (must produce your own ??? cord); didnt seem to get hot enough; more like a vaporizer attached to a bong than a dab nail <b>Rating:</b> 1.7

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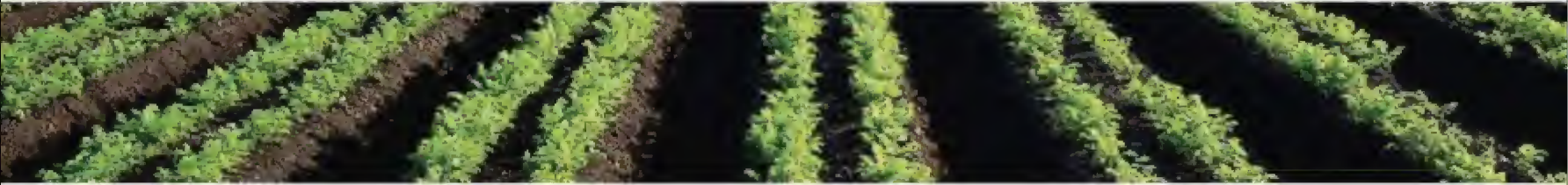


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**XL750**



Dimensions: 23"x17"x3.5"

Weight: 28lbs

Actual Wattage: 450w, 120-240v

HID Wattage Equivalent: 750w

Total Diodes: 208

Footprint: 4'x4'

Infrared/Ultraviolet Diodes: Yes

**XL1000**



Dimensions: 26"x20"x3.5"

Weight: 36lbs

Actual Wattage: 650w, 120-240v

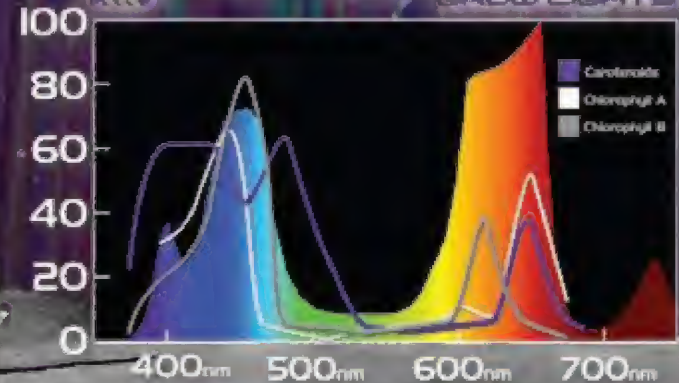
HID Wattage Equivalent: 1000w

Total Diodes: 320

Footprint: 5'x5'

Infrared/Ultraviolet Diodes: Yes

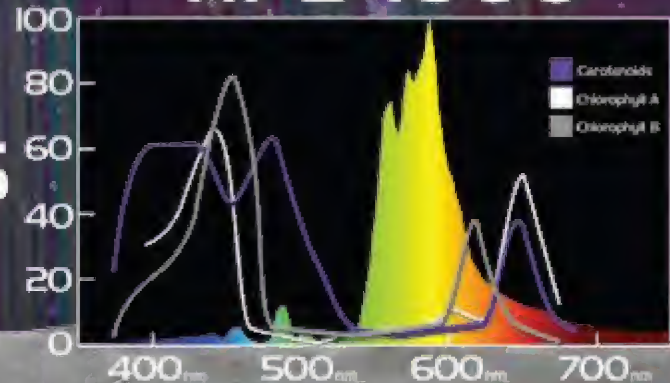
## KIND LED GROW LIGHTS



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VS

## HPS 1000



# It's All About Atmosphere

Technology has made dialing in your grow easier than ever. *By Nico Escondido*



**W**hen it comes to indoor cultivation, it's all about atmospheric control—after all, that's one of the primary advantages of growing indoors. But what exactly does this entail? What are the best practices for refining your garden to get the best quality and the highest yields?

Let's take a look at some of the major aspects of atmospheric control, as well as some of the latest resources and developments that today's technology has to offer in making your garden a happy home for our favorite plant.

## The Basics

When we discuss atmospheric control, it all comes down to three major components: light, temperature and humidity. There are tangents to each of these categories that we will touch on as well, but this basic breakdown covers the general elements that most affect conditions in an indoor grow.

Plants are pretty, but high above the canopy there is a lot going on. Garden: MMJ America, Denver.

## Light

We all know that light is essential for plant life. Light supplies the energy used in photosynthesis, the process that creates food for the plant. However, the same light so vital to a plant's health and development also produces a significant amount of heat. This heat needs to be dealt with, and there are several ways of doing that.

Of course, adding air-conditioning to the growroom is one solution, but this can get costly, especially for larger-scale grows. Perhaps the most popular method for dealing with light-generated heat is to use a combination of lamp cooling and room exhaust (such ventilation will be covered more in a bit). Lamp cooling involves the use of fans either to blow cool air over the bulbs, or to suck hot air off of them and expel it from the garden. Some advanced growers might even consider using water-filled jackets to cool the bulbs, but this technology has proved expensive and less effective.

Another solution is to manage the lighting using timers and controllers that allow individual or groups of lights to alternate their running times when temperatures begin to climb above a set point. Today, there are plenty of controllers that offer options for lighting control, and some of them even allow remote control of the entire growroom (which we'll get to shortly).

## Temperature

The growroom's temperature is the direct result of both lighting and the outdoor climate: The hotter it is outside, the hotter it gets in your growroom as well. As temperatures begin to rise, photosynthesis, CO<sub>2</sub> uptake and plant growth all begin to slow. In climates with higher temps, growers usually have little choice but to install some sort of AC unit to aid in cooling their gardens.

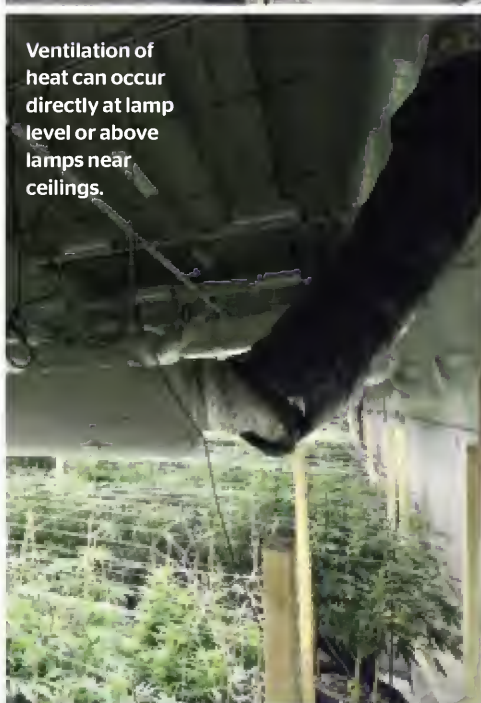
Optimal temperatures vary, depending on the focus. For cannabis plants (with the exception of cuttings), the ideal growroom temperature is around 72°F, with a minimum of about 66°F and a maximum of 78°F. In terms of the plant's root zone, this needs to be kept fairly cool—usually under 70°F. Grow-medium temperatures can be easily taken with a soil probe or stake thermometer. Equally important in hydroponic systems is the temperature of the nutrient solution being used: Advanced growers will often employ water chillers to keep the temperature below 65°F in order to help cut down on water-borne pathogens.



Air-cooled lighting like this HPS system is always a great idea.



Industrial-sized AC units help control temps in large format grows.



Ventilation of heat can occur directly at lamp level or above lamps near ceilings.

## Humidity

Humidity is a crucial and sometimes-overlooked factor in many indoor grows. If the humidity is too low, CO<sub>2</sub> and light absorption are minimized—but if it's too high, pathogens, bacteria, mold and pests begin to flourish. Both air temperature and ambient moisture contribute to a garden's humidity; as the temperature drops, the humidity level begins to rise.

It's a delicate balancing act, but big swings in a growroom's temperature can severely affect the humidity. If temps drop during the dark cycle by more than 12°F to 14°F, humidity may climb beyond optimal levels, at which point flowers can develop botrytis and mildew may form on the leaves and walls. If condensation sets in, there are big problems brewing. Optimal humidity levels for indoor grows range from 40% to 60%, but the higher levels make plants more susceptible to pests and disease. Advanced growers usually settle on a humidity level from 45% to 50%.

## Advanced Atmospheric Control

### Ventilation & Circulation

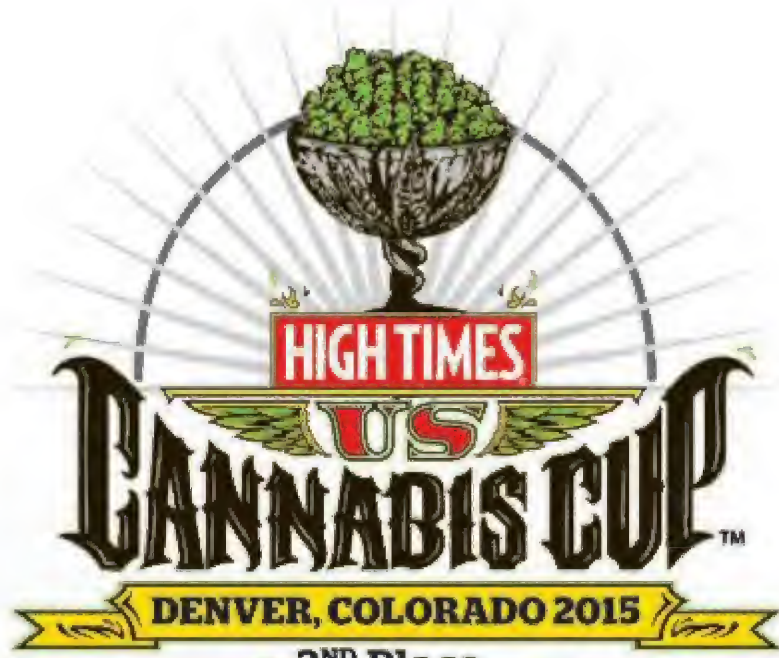
Controlling ventilation and circulation is one of the best (and easiest) ways to address or avoid many of the problems associated with temperature and humidity. Good ventilation—meaning the intake of fresh, filtered air and the exhaust of warm, spent air—is an essential component of atmospheric control. Good air circulation is another important factor, as it prevents heat pockets from building up and helps move air over plants for respiration.

The best place to bring fresh air into the growroom is near the floor, where air temperatures are cooler; the best place to exhaust air is near the ceiling and above the light banks, where air temps are the hottest. It is also wise to filter any incoming air to remove dust and pathogens, and to filter the exhaust to remove any odors.

The best way to coordinate the ventilation in your growroom is through automated-control systems. These act as on/off switches for everything from the intake and exhaust fans to the CO<sub>2</sub>-enrichment system and light banks. The controllers measure atmospheric factors such as temperature, humidity and CO<sub>2</sub> levels. When the temp gets too high (i.e., past a specific point set by the grower), the controllers can turn on fans to exhaust the hot air, or turn off certain lights to cool the garden's atmosphere.

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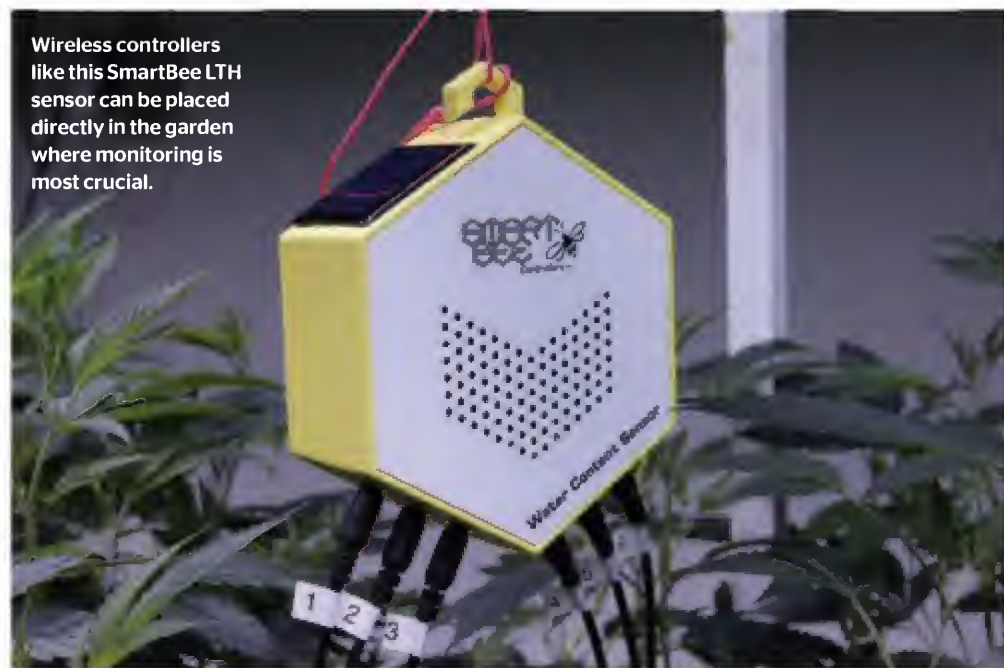


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## Supplemental CO<sub>2</sub>

Carbon dioxide is an essential part of photosynthesis. Many commercial growers add CO<sub>2</sub> to help boost yields, but in smaller gardens it's not always necessary. The primary consideration when using a CO<sub>2</sub>-enrichment system is how it interacts with other atmospheric-control systems. For example, careful coordination is needed to ensure that the CO<sub>2</sub> system isn't running at the same time as the exhaust fans—otherwise, the CO<sub>2</sub> will be wasted. Also important is ensuring that the CO<sub>2</sub> system only runs during the light cycle, when photosynthesis is occurring.



Wireless controllers like this SmartBee LTH sensor can be placed directly in the garden where monitoring is most crucial.

## Technology & Atmospheric Control

In the past few decades, indoor horticultural has relied on various devices to manage the environmental conditions in our gardens. These devices range from the very basic, such as simple timers, to more complex units that merge several system controls into one platform. The most advanced of these controllers are all-in-one units that can automate and manage entire grows from a single panel.

Today, the manufacturers of these devices are making use of the latest technologies to take the most advanced controllers one step further. Utilizing the power of the Internet and Wi-Fi networks that are virtually omnipresent today, these devices have morphed into fully automated remote-control systems that are accessible anywhere there is a wireless signal.

## SmartBee Controllers

One such company on the forefront of fully automated, remote-control garden-management solutions is SmartBee Controllers. Using an array of different sensor types that wirelessly interface with a central

control hub, SmartBee's equipment can manage all atmospheric conditions, sending real-time data to a smartphone, tablet or desktop computer for remote access and control over the growroom—even from hundreds of miles away.

## How It Works

The SmartBee system uses a series of sensors that continually take measurements of the growroom's atmosphere, including temperature, humidity and CO<sub>2</sub> levels. Other controllers connect to the light system and allow growers to turn these on and off for greater control

and flexibility. Additional modules can also connect to the HVAC, irrigation and security systems.

All of the information collected by the sensors is sent to the SmartBee Hive Gateway, which acts as the primary "brain" of the network. It is this nucleus that serves as the main portal for all communication between the wireless sensors, the Internet and your web-enabled devices. Incoming data from the sensors across all of the systems within the growroom is logged, processed, and can be sent to both a local storage device via hardwire and to your preferred web device via the Internet (either Ethernet or Wi-Fi). Various types of data, such as daily temperature swings, humidity ranges and CO<sub>2</sub> levels, are formatted into easy-to-read charts and delivered right to the palm of your hand, anywhere in the world.

Additional functionality allows growers to power on or off any growroom systems connected to the SmartBee hardware, including lights, irrigation, intake and exhaust fans, CO<sub>2</sub> enrichment, dehumidifiers and HVAC.

## Higher Tech

The SmartBee system enables growers to have full access and control over all of the environmental conditions in their garden, even from thousands of miles away. Here's a quick look at the various types of sensors, controllers and other gear employed by the system, plus their various functions.

**LTH Sensors:** Also known as light, temperature, and humidity sensors (hence the "LTH"), these small devices are placed around the growroom to continuously monitor these conditions wirelessly. Another smart feature is a pair of solar panels on top of the unit that harvest excess energy from the lights, helping to keep the battery charged at all times. You can deploy multiple LTH sensors to monitor specific areas of your garden, utilizing the readings from individual sensors via your handheld device.

**CO<sub>2</sub> Sensors:** For use in growrooms employing supplemental CO<sub>2</sub>, these sensors take samples of the garden air and send the data to the Hive Gateway. The Hive then activates or deactivates your CO<sub>2</sub>-enrichment system and exhaust equipment as necessary to maintain the ppm levels based on your set point.



Soil probes take environmental control to the next level.

**Medium & Irrigation Control:** Among the most useful components of the SmartBee system are the soil probes and irrigation controls. These combine the benefits of timed and measured feedings with actual measurements of the volumetric water content of your medium.

As the water-content sensors measure the moisture level within the medium, alerts can be sent to the grower if the levels fall below a set limit. These probes can also be used more simply as an automated timer that turns a watering system on and off at set times and durations, depending on the moisture content within the medium. Once the set points are established, the Hive Gateway gathers and interprets sensor data and waters accordingly, thus maximizing the efficiency of your current irrigation system.



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**Power & Security Control:** Power-control modules and security interfaces are also available with the SmartBee system. These modules are used in conjunction with the Hive Gateway to create a more comprehensive smart network using all of your existing grow equipment.

The power controls come in the form of a four-outlet smart power strip, allowing for up to four electronic devices to be powered on or off independently from anywhere. There is also a smaller, single-outlet smart plug for individual gear pieces or more remote locations in the growroom. These intelligent outlets allow you to remotely set schedules and thresholds, affording wireless control of humidifiers, fans, heaters and so on. Power-failure detection, active electric-current monitoring and fail-safe features make these outlets even more attractive.

SmartBee will also soon be offering motion detectors, door and window sensors, and video monitoring with text-message alerts and remote wireless feeds from your growroom to your mobile device. Using infrared technology, the motion detectors and entryway sensors ensure that intruders cannot gain access to your growroom unnoticed. These sensors can also be configured to turn on lights or alarms.

**Access:** Having a networked garden that offers wireless remote control of all atmospheric and environmental conditions may seem futuristic, but the reality is that the future is already here. Bluetooth, satellite and Wi-Fi signals are commonplace in today's world, and this technology has fully infiltrated our growrooms as well. It is time to use it to our full advantage.

### Data collection and presentation make a garden's needs easy to understand, removing any guesswork or uncertainty about the growroom's conditions.

Of course, smart growers understand that technology is no substitute for actually being in the garden, seeing the plants with their own eyes. But systems like the SmartBee help to ensure that they can manage their garden if circumstances require their presence elsewhere, and that everything works on schedule—or corrects itself when the schedule needs adjusting. Also, the data collection and presentation make a garden's needs easy to understand, removing any guesswork or uncertainty about the growroom's conditions.

As the Hive Gateway manages the incoming sensor data from your garden, it delivers continuous and secure updates, accessed via an authorized

account that monitors and controls the modules inside your growroom (or rooms). This data is delivered right to your hands via any mobile or desktop device that can connect to the Internet.

The interface first offers a dashboard giving the average atmospheric conditions for each room. From there, users can toggle through various screen types

and formats that offer the data in simple-to-read charts, graphs, or lists for each sensor and control system in use. Lighting, heating, cooling, humidity, dehumidifying, irrigation, CO<sub>2</sub>, brightness, moisture and soil conditions are all measured and reported back to the grower. This data can be viewed separately or all together, and it can also be separated into levels for the past hour, past day or past week. On/off controls for each system are at the grower's fingertips, as is the ability to adjust settings.

All told, there's not much that an intelligent remote-control system like this cannot help a grower to do. And, just like that, cannabis cultivation has emerged in a new way in the 21st century. ✨

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*Legendary grow guru Jorge Cervantes walks you through the ABCs of the flowering stage.*

# flowering for pea

*By Jorge Cervantes*

Pointy sessile resin glands (cystolith hairs) contain no cannabinoids, but the capitate-stalked resin glands with a ball on top are packed with cannabinoids.

Capitate-sessile (bulbous glands) are visible near the center of the leaf of Blueberry × Sandstorm.

Opposite page top: Bulbous glands sit on a base of a few cells located on foliage and flower buds.

# k ripeness

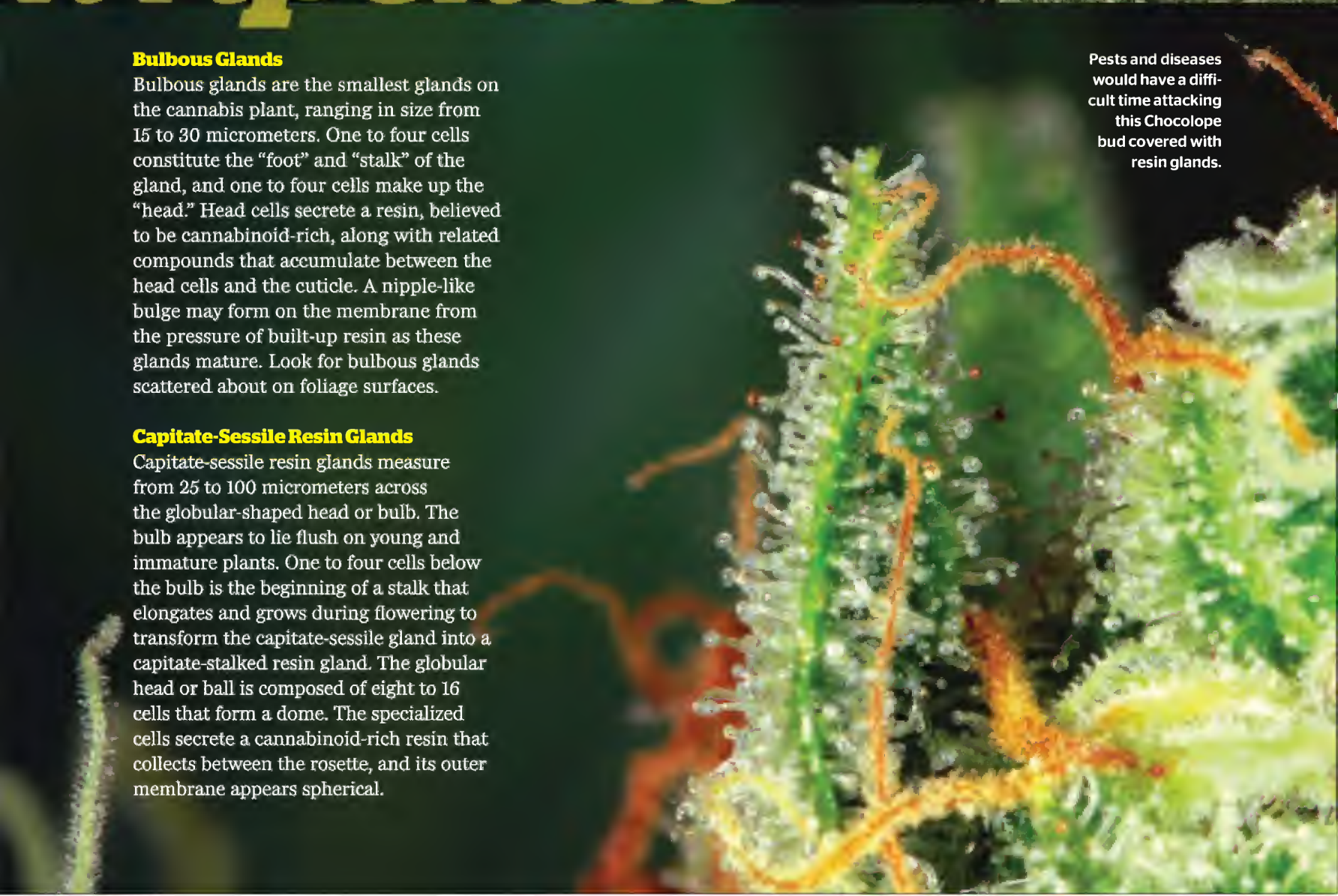
## Bulbous Glands

Bulbous glands are the smallest glands on the cannabis plant, ranging in size from 15 to 30 micrometers. One to four cells constitute the “foot” and “stalk” of the gland, and one to four cells make up the “head.” Head cells secrete a resin, believed to be cannabinoid-rich, along with related compounds that accumulate between the head cells and the cuticle. A nipple-like bulge may form on the membrane from the pressure of built-up resin as these glands mature. Look for bulbous glands scattered about on foliage surfaces.

## Capitate-Sessile Resin Glands

Capitate-sessile resin glands measure from 25 to 100 micrometers across the globular-shaped head or bulb. The bulb appears to lie flush on young and immature plants. One to four cells below the bulb is the beginning of a stalk that elongates and grows during flowering to transform the capitate-sessile gland into a capitate-stalked resin gland. The globular head or ball is composed of eight to 16 cells that form a dome. The specialized cells secrete a cannabinoid-rich resin that collects between the rosette, and its outer membrane appears spherical.

Pests and diseases would have a difficult time attacking this Chocolope bud covered with resin glands.



### Capitate-Stalked Resin Glands

Capitate-stalked resin glands, or trichomes, appear and become visible with the naked eye when flowers form. Use a 10x to 30x handheld lens to distinguish between the resin glands—bulbous, capitate-sessile, capitate-stalked and nonglandular trichomes. Look for them on female flower bracts and new flower growth and surrounding foliage, where they form heavily on the plant. The resin glands also tend to accumulate heavily on the veins of lower leaf surfaces around the flower buds. Cannabinoid-potent varieties typically contain higher concentrations of capitate-stalked resin glands.

Male plants and flowers contain smaller and lower concentrations of less-potent stalked glands than are found on the female bracts. Male flowers typically have a row of large capitate-sessile glands along opposite sides of the anthers.

Unless clearly visible on leaf surfaces, few cannabinoids will be found on older leaves. Leaves around the flower buds are much more densely populated with capitate-stalked resin glands rich in cannabinoids.

Capitate-stalked resin glands are composed of a stalk with a bulbous head. They look like a post with a knob, ball or bulb at the top. They form mainly on flower buds and small leaves. The highest concentration of cannabinoids is located at the base of the bulbous resin head.

In the illustration below, disc cells are shown attached to foliage by stipe cells (red) and basal cells (green). The plastid (orange) in disc cells secrete lipoplasts where they synthesize lipophilic substances that accumulate and ultimately migrate and form vesicles (blue). THC occurs in the top of the capitate-stalked resin gland. For more on this complex subject, see [marijuanagrowing.com](http://marijuanagrowing.com).

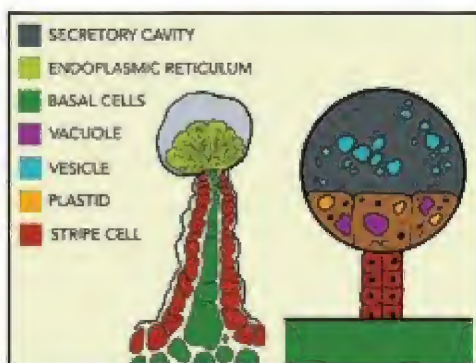
### Cannabinoid Profile

Many cannabinoids besides THC have unique effects on brain functions, which in turn cause various effects on human cognition. Different levels of cannabinoids relative to one another also produce different effects. As a result, measuring the “potency” of cannabis plants is problematic.

A very resinous plant can have low levels of THC and high levels of CBD. Or a plant with little resin can contain high levels of THC and low levels of CBD. The cannabinoid profile depends on the makeup of the cannabinoids and other active ingredients. For example, resin consists of cannabinoids and other



Look closely and you can see the pointy cystolithic, nonglandular trichomes alongside the more numerous capitate-stalked glandular trichomes.



substances, such as non-psychoactive phenolic and terpenoid polymers, glycerides, and triterpenes. When resin is concentrated in kief or hashish, about a third is water-soluble plant material, another third is non-psychoactive resins, and the balance cannabinoids.

In many cannabis plants, THC may be only a very small percentage of the total cannabinoids. The remainder (5 to 10 percent) of the resin will be essential oils, sterols, fatty acids, and various hydrocarbons common to plants.

About 80 to 90 percent of the cannabinoids are synthesized and stored in microscopic resin glands that appear on the outer surfaces of all plant parts except the root and seed. The arrangement and number of resin glands vary somewhat with the particular strain examined. Marijuana varieties generally have more resin glands than hemp, and they are larger than the resin glands on non-drug varieties.

Resins occasionally secrete through pores in the membrane of gland heads. Usually secretion occurs many weeks after stalked glands appear. The glands seem to empty their contents, leaving hollow spaces (vacuoles) in the stalk and head cells. After secretion, the glands cease to function and begin to degenerate. Gland heads, stalks and trichomes become clumped together, and the whole flowering surface becomes a sticky mass. This is not necessarily desirable.

Small quantities of cannabinoids are present in the internal tissues of the

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plant. The bulk is found in small single cells (non-articulated laticifers) that elongate to form small, individual resin canals. The resin canals ramify the developing shoots and penetrate the plant's conducting tissue (phloem). Minute clumps of resin found in the phloem are probably deposited by these resin canals. Other plant cells contain insignificant amounts of cannabinoids; probably a good 90 percent of the plant's cannabinoids are localized in the resin glands.

### Florigen

Florigen (also known as “the flowering hormone”) is the term used to describe the molecules that initiate and maintain flowering. Since the 1930s, biologists have believed that florigen is responsible for controlling flowering in plants, but it was not until August 2011 that a group of Japanese scientists discovered specific florigen hormone receptors. Florigen is synthesized in leaves and stimulated by environmental changes such as photoperiod and temperature.

Florigen is found at the apex of shoots where buds grow to induce flowering. It directs vegetative stem apices to become flowering stem apices. The subject is quite complex and beyond the scope of this book. I started a thread about florigen on the forum at [marijuanagrowing.com](http://marijuanagrowing.com) that encompasses further research and discussion.

### Indica, Sativa and Ruderalis

Induce *sativa* and *indica* varieties and crosses to flower in greenhouses and indoors by giving plants more hours of total darkness and fewer hours of light.

Outdoors, cannabis will flower when it receives 12 hours or more of darkness daily. Give cannabis 12 hours of uninterrupted darkness and 12 hours of light to induce visible signs of flowering in about two weeks. This program is effective in all but the latest-blooming pure-*sativa* varieties.

Medicinal cannabis gardeners with a vegetative room illuminated 18 to 24 hours a day and a flowering room or greenhouse with 12-hour days and 12-hour nights create environments that mimic the photoperiod in spring and fall. With this simple combination, a crop can be harvested every six to 10 weeks. In warm southern climates or with the help of artificial light, the harvest can last all year.

Plants show sex (male or female flowers) during the pre-flowering stage, which actually occurs during late vegetative growth. Once the sex of the plant is established, males—unless used for



Original Afghani #1 from 1978 had reddish stigmas, but more often this variety would have had white stigmas.



This pure *sativa* from Mexico shows classic long thin leaf blades.



The tall Durban Poison phenotype has large narrow-blade *sativa* leaves.

breeding—are harvested before they shed pollen, and females are coaxed into higher yields. Once the photoperiod is set, disrupting it can cause plants to suffer stress. If they suffer enough stress, intersex (hermaphrodite) tendencies increase. The water intake of flowering plants is usually somewhat less than it is during the vegetative stage. Adequate water during the flowering stage is important for plants to carry on their internal chemistry and cannabinoid production. Withholding water to “stress” a plant will actually stunt growth and diminish yields.

Pure *Cannabis sativa* has its origins in tropical regions. Tropical varieties are accustomed to 12 hours of sunlight and an equal period of darkness all year round. The climate is such that they have a long and temperate growing season that allows leisurely and consistent growth. Super-intense sunlight can be difficult for them to assimilate, since many tropical *sativa* varieties grow under the shade of a jungle canopy.

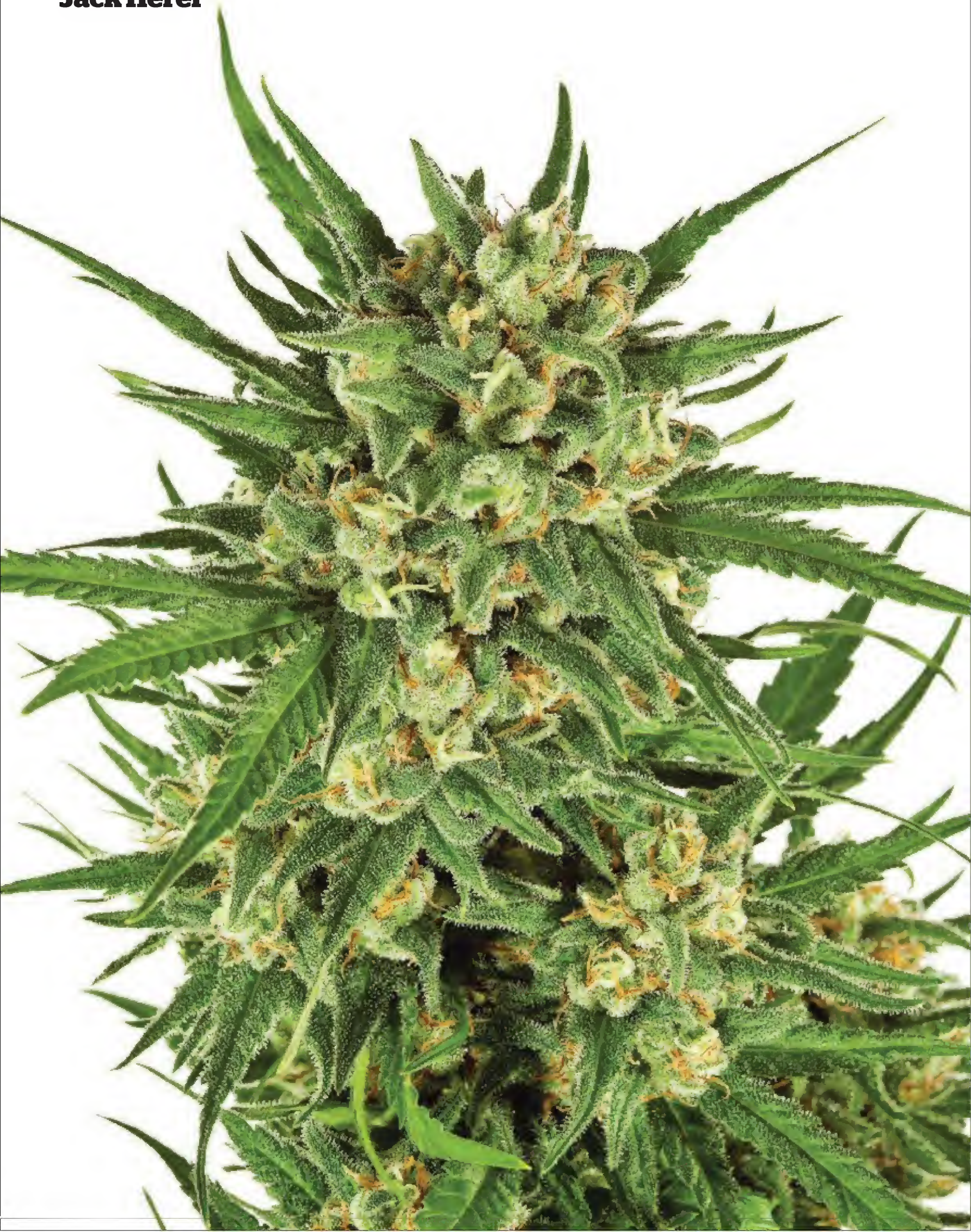
Indoors, gardeners often give pure tropical *sativas* too much light. The result is even smaller and lower-yielding flower buds. Lamps should be set further away or outfitted with lower-wattage bulbs that produce less intensity and heat. This will ensure that *sativa* plants won't get as hot, while receiving adequate light to grow big flower buds. Give pure tropical *sativas* more darkness and less light to induce flowering—13 or 12 hours of darkness and 11 or 12 hours of light. Some gardeners go so far as to gradually decrease the light to 10 hours daily, with 14 or more hours of darkness. Such practices simulate native climates, which gives plants a chance to express their genetics. This technique will promote bigger flower buds.

Auto-flowering *Cannabis ruderalis* varieties do not require long nights to flower. *C. ruderalis* starts to flower within a month of germinating. Many auto-flowering *ruderalis* varieties are ready to harvest 70 days after planting and produce up to 4 ounces (113.4 grams) of dried medicinal flower buds when properly grown. European breeders have feminized many auto-flowering varieties. To date, the top varieties produce 3 to 3.5 ounces (85 to 99.2 grams) in 70 to 80 days.

### Nonglandular Trichomes

Nonglandular or cystolithic trichomes, also known as plant hairs, are common on many plants and do not produce cannabinoids. These trichomes have a pointed tip and are often long and hair-like. The waxy, protective trichomes

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are most common on leaf undersides, petioles and stems.

More common on some varieties than others, cystolithic trichomes are most abundant on outdoor plants. More cystolithic trichomes form on plants when they harden off and are moved from indoors to outdoors. The glands exude insecticidal and miticidal substances to gum up pests' mouthparts and repel them, but they have no useful cannabinoids.

### Terpenes and Essential Oils

Five essential oils—the terpenes (mono- and sesquiterpenes), pinenes (alpha- and beta-), limonene, mycene and beta-phallandrene—impart virtually all of the specific aroma, flavor and character (sweet, minty, citrusy, etc.) found in odorless cannabinoids. The volatile oils enter the atmosphere and dissipate over time. This causes cannabis to lose much of its bouquet and flavor when stored.

Essential oils constitute 0.1% to 0.3% of the dry weight of a fresh marijuana sample—about 10% of the weight of the cannabinoids. For every 1,000 grams of dry bud, from 1 to 3 grams of essential oil is extracted. Essential oils are predominately found inside the heads of resin glands, and they have been



This electron scanning microscopic view at 370x of a single capitate-stalked resin gland allows us to distinguish individual cells.

detected in the resin canals or laticifers.

The mix of essential oils is diverse in different samples of cannabis. Some scientists hypothesize that cannabis content and fragrance may be associated because essential oils are precursors or are related to the cannabinoids.

### Trichomes

As cannabis author, researcher and photographer Mel Frank has noted: "All mice are animals, but not all animals are mice. Similarly, all resin glands are trichomes, but not all trichomes are resin glands. Trichome is a general botanical

term for any outgrowth of an epidermal cell. Trichomes can be scales, root hairs, glandular or nonglandular, single or multicellular, often hairlike growths. Cannabis has three kinds of resin glands (bulbous, capitate-sessile, and capitate-stalked) and several of non-resinous silica and carbonate warts and hairs, all called trichomes."

Biologists hypothesize that trichomes evolved as a defense mechanism of the cannabis plant against a range of potential enemies. These adhesive sprouts form a protective layer against offensive insects and mites, preventing them from reaching the surface of the plant. The chemicals in trichomes make cannabis less palatable to animals and can inhibit the growth of some types of fungus. The protective trichomes also help insulate plants from desiccating wind and low humidity as well as forming a natural "sunscreen" to protect against UVB light rays. Humans may have promoted heavier resin production through casual selective breeding. 🌿

*Adapted from The Cannabis Encyclopedia by Jorge Cervantes, \$50 softcover, \$70 hardcover. Find it at Amazon.com or by visiting Jorge's website, MarijuanaGrowing.com.*



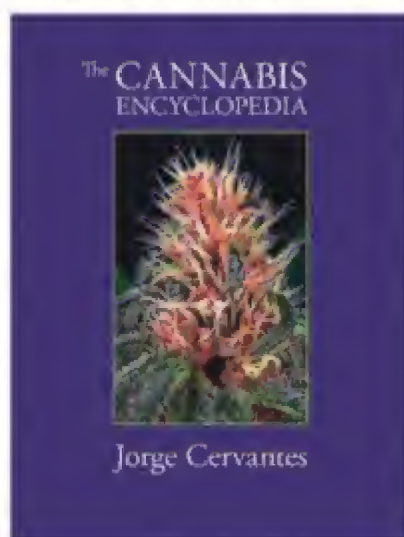
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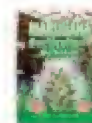
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# Good Vape Vibes



When a consumer need is identified, entrepreneurs are always ready to strike. Like the guys behind OpenVAPE, who saw a demand for high-quality cannabis oil and vapor pens and jumped in to fill it—quite literally!

— Story & photos by Dan Skye —

**L**egalization has enabled new talent and fresh business perspectives to enter the cannabis industry. It's not too hard to understand why: When the threat of having your life upended for cultivating a plant—much less smoking it—no longer exists, creativity blossoms. New business models are created, new products emerge, and new networks of commerce evolve to sell them.

In 2000, Colorado voters passed Amendment 20, which made access to medical marijuana part of the state's constitution. But for nine years, the fledgling medical marijuana industry languished, because the Colorado Department of Public Health and Environment barred

individual caregivers from providing medicine to more than five patients. Then, in 2009, the state Board of Health overturned that five-patient limit, and the cannabis industry found its footing. Dispensaries opened across the state, and the Colorado "Green Rush" was born.

Tim Cullen was a high-school biology teacher and botany expert who had been legally growing cannabis since 2000 in order to treat his Crohn's disease. Another budding ganjapreneur, Ralph Morgan, worked with his wife in the health-care industry. Both men decided to jump into the fray.

Tim founded the Colorado Harvest Company, while Ralph opened Evergreen Apothecary, both in Denver. Tim



recalls: "In 2009, there was no Marijuana Enforcement Division [MED], no Denver licensing and no state licensing. Stores weren't collecting or returning sales tax. There was really no oversight, because things had happened so quickly. It wasn't until the middle of 2010 that the MED formed and Colorado passed the bill that laid the groundwork for the rules we still play by today—how cannabis is transported, the badging of employees, the collection of taxes.



Tim Cullen (above) oversees the grow ops and five retail locations that make up Colorado Harvest Company and Evergreen Apothecary.



Freshly harvested buds are ready for consumers.



Ralph Morgan directs Organa Labs operations.

**“We were looking for a healthy alternative to smoking, an organic extraction method that we could recommend.”**

“Ralph and I met each other and decided that we’d survive the new regulations better if we were a little bit bigger,” Tim continues. “We were like puzzle pieces that fit together: Evergreen Apothecary is a really busy retail location on South Broadway, but it had a really undersized grow; Colorado Harvest Company had a pretty large grow at that point in time, but the dispensary was off the beaten path. We thought that the big grow could supply the busy store, and we’d figure the rest out later. So we threw all of our chips on the table, divvied it up 50/50 and became partners.”

Organa Labs was part of the partnership. Ralph and his wife had started Organa in 2010 after recognizing the demand for organically extracted oils with medicinal applications. “We’ve been doing this for a while,” Ralph says. “We

were one of the first licensed extraction companies in the US working with CO<sub>2</sub>.”

This was important because carbon dioxide renders any residual solvents from the process relatively harmless, while killing all of the bacteria, viruses and molds that may have been present in the product.

“I think there are several wonderful companies that use hydrocarbon extraction,” Ralph adds, referring to another popular method for producing cannabis extracts, “but in 2010, that wasn’t the case. CO<sub>2</sub> extraction was something that the food and flavor industry had popularized as an organic extraction method for the essential oils of plants. That’s what attracted us—especially back then, because the industry was all medical. We



Organa Labs exports its extraction technology to legal states.



Advanced Grow Labs of West Haven, CT produces extraction on-site.

were looking for a healthy alternative to smoking, an organic extraction method that we could recommend.”

Tim remembers early troubles with the market. “At the point of sale,” he says, “a hydrocarbon-extracted oil, wax or shatter looks almost exactly the same as a CO<sub>2</sub>-extracted oil, wax or shatter. The difference is that one might cost \$60 a gram, and the other one is \$25 dollars a gram. So we were getting beat up in the market; consumers weren’t educated as to the difference between the two products. Organa Labs hovered for a long time, sort of breaking even, bleeding a little bit. But our dispensaries kept the lab alive.”

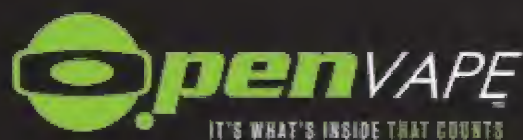
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Among its first products was Can-naTab, a 10-milligram sublingual tablet—not a very strong dose, but perfect for patients who needed a dependable, relatively small amount of cannabis medicine. Organa had also launched several different vaporizer pens by this point, but it was having trouble getting anything to stick in the marketplace.

The fourth pen that Organa Labs marketed was its breakthrough product. The development of technology that allowed

a pen to vaporize cannabis oil, combined with Organa’s decision to market strain-specific extracts, led to the creation of O.penVAPE.

Several cannabis entrepreneurs, including the owners of the successful La Conte’s retail outlets and Bakked, a respected competitor to OrganaLabs, formed the new entity called O.penVAPE. pooling talent and resources in order to offer the market a product that they all believed in.

“It was an opportunity to be a part of something that was much greater than our sums” said Ralph Morgan, now O.penVAPE’s CEO.

It may be the highest of hyperbole but Chris McElvany, O.penVAPE’s CTO says that their company’s success has been described as the “Google of cannabis.”

“We’re often asked how we’ve grown to be arguably the largest brand in this space,” he says. “It’s achieved by our philosophy of partnership. Our collective wisdom always prevails.”

“We may not always agree, but we disagree well,” adds Jeremy Heidl, the COO at O.penVAPE.

In creating the pens, the partners looked toward successful innovations from other industries. “We used the playbook from the Gillette Razor model,” Tim acknowledges. “We were the first to launch strain-specific cartridges. Gillette gives the actual device away for free and sells you the blades. That’s what we started doing.”

However, the two partners were leery of getting caught up in a situation where the device became their actual commodity. “We wanted to sell cannabis oil, not pens,” Tim explains. “That’s why it was really easy for us to give the pen

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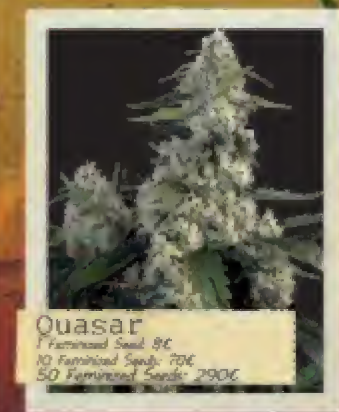
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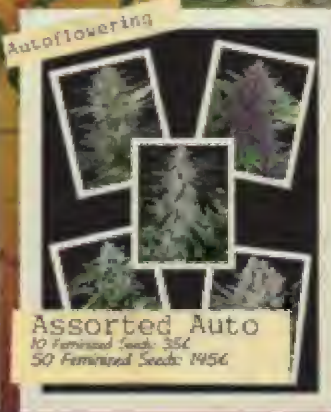
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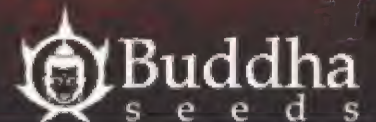


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away for free. We're not marketing the pen; we're trying to market the oil that's inside of it. Organa Labs makes the oil inside the pen. That's marketed under the O.penVAPE name. But it's the stamp of Organa Labs that consumers care about: It means that the oil is strain-specific and CO<sub>2</sub>-extracted."

The pens were an immediate hit in Colorado. Dispensaries in other states began to inquire about licensing the brand. Over the past two years, Organa Labs and O.penVAPE have expanded into nine different states. Because current laws prohibit the transportation of cannabis across state lines, the company rebuilds its lab in each individual state, then sources the raw materials there and markets its finished products within the state as well.

Ralph and Tim divide the business responsibilities between them. Tim oversees the five retail locations that make up the Colorado Harvest Company and Evergreen Apothecary, as well as the three gardens that supply them. (O.penVAPE uses trim from the gardens for oil production.)

Ralph is often on the move as Organa Labs and O.penVAPE expand, most recently checking in with Advanced



Morgan (far right) with the Advanced Grow Labs crew.

**"Organa Labs and O.penVAPE are poised to become one of the first national cannabis brands to emerge."**

Grow Labs of West Haven, Connecticut, as it recreates the Organa Labs model. "Every deal is different," he says. "Each is based on local laws. What we look for, first, is a good cultural fit—good operators, good people. Secondly, how do we finance this? We may participate, we may help in a large way—or we may find a scenario where people have the funds but need our expertise."

Currently, Organa Labs has bricks-and-mortar operations set up in eight states. Other labs are in various stages of completion, usually awaiting local municipalities to catch up with the laws themselves.

Ralph explains the advantages: "If you have a passion for making chicken, you could do it yourself and find your own secret spices. Or you could get a franchise, like KFC, and benefit from two things: proven processes and brand recognition—assuming it's favorable. That's what our licensees enjoy as well: not only the processes, which we're forever improving upon, but the reputational benefits from carrying a known brand in their stores."

"We don't enjoy the mass distribution that Coors or Budweiser gets by having, say, one plant in the Midwest that distributes all over," Tim adds. "We have to create our production lines everywhere we go. But I think Organa Labs and O.penVAPE are poised to become one of the first national cannabis brands to emerge. There hasn't been one yet, but we aim to be a large player on the national scene." ✨

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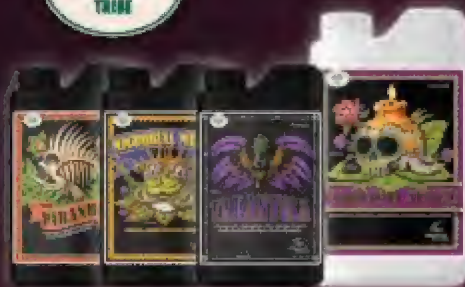
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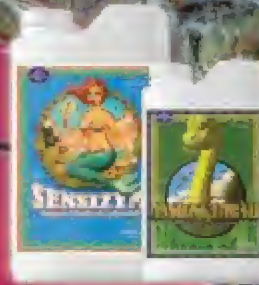
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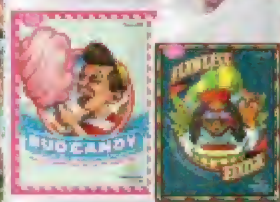
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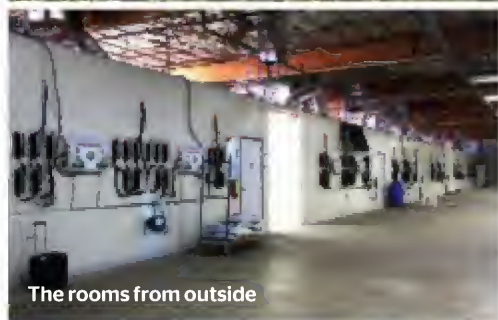
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# A Phoenix Grow Rises



Almost ready to harvest in room one



The rooms from outside



Bubba Skywalker gets frosty.

The legendary author of the *Marijuana Grower's Guide* visits a legal marijuana facility in Arizona and reveals what it takes to grow huge amounts of pot indoors in a desert climate. *Story & Photos by Mel Frank*

## Arizona Getaway

I recently visited a new legal commercial grow in Phoenix, Arizona, where the recipients of the state's cannabusiness licenses are selected by lottery. In early 2012, these particular lucky winners received three licenses, with which they formed the Herbal Wellness Center, Inc. Two of their dispensaries will be located in Chandler and the third is open in Phoenix, near the grow shown here, which is their first successful garden at their new 29,000-square-foot facility. Although the owners were licensed back in 2012, it took four appeals hearings to reconcile the objections from neighboring businesses before they could begin construction of a grow facility in April 2014.

The owners also had difficulties getting this particular facility up and running well. With the current "green rush" in marijuana investment, it seems that anyone who's ever grown a plant thinks that he's an expert. But, as many investors sadly learn, it's one thing to maintain a decent-sized growroom under a few lights, and quite another to set up and manage a large, multi-room, factory-sized, perpetual-harvest commercial

grow. One of the owners of this facility was not unfamiliar with this situation: He had grown smaller gardens after becoming vested in Arizona's licensed version of medical marijuana, but he knew that a facility of this magnitude was beyond his experience. So he hired (and ultimately fired) three different "expert growers" on several trial runs, all with very disappointing results, before contracting with the Los Angeles-based Clade9 consultant "Vector Beans."

Vector decided that the best course would be to discard all of the earlier plans and architectural blueprints and start with a relatively inexpensive basic-growroom configuration, albeit modified into a sequential grow op with five flowering rooms, each one outfitted with two dozen 1,000-watt color-corrected high-pressure sodium (HPS) lamps, at \$12 a bulb. Each 28-by-30-foot flowering room would be staggered two weeks apart in development. A sixth room would be outfitted with metal halide (MH) lights for vegging, while a seventh room would have T5 panels for mothers and clones, and a smaller eighth room would be set up for manicuring and drying.



These plants are nearing the end of the vegetative stage.



Yin Yang CBD sativa takes longer to mature.



Clones thriving under Metal Halide lights



T5 fluorescent lighting in the mother room reduces electric use.

## Perpetual Harvest

Harvesting a room every two weeks allows enough time to manicure and dry the harvested bud and then empty the drying room before the next flowering room is ready. Once this perpetual-harvest system had proved the concept, and a Clade9-trained crew had proved its sustainability, the facility would be expanded with four additional eight-room systems mirroring this setup, but with improved equipment and layout.

Vector expects about 1.5 pounds of bud per light, or 36 pounds per room, but he confided that he'd like to reconfigure the grow op using larger sliding beds and a more efficient layout to boost the yield to over 2 pounds per light. However, first he wanted to demonstrate that the system was not just workable but efficient, before asking the owners for more costly improvements, including higher-intensity double-ended lamps.

Complicating this test run, Vector insisted that he could manage 18 of

Clade9's cannabis varieties—many of them proprietary—and harvest them in the very first grow, so that the Herbal Wellness dispensary could immediately offer its patients a broad selection of world-class strains. Varieties such as Donna, Grand Daddy Purple, Bubba Skywalker, Jack Herer and Yin Yang (with a 9:9% CBD-THC ratio) were among the 18, all growing side by side in the flowering rooms with only a few days until the first batch is ready to harvest.

Harvesting this way will be tricky, since not all of the varieties will mature at the same rate. For the near future, Vector recommends continuing with the multiple-variety growrooms, as Herbal Wellness does not yet have enough dispensaries open to absorb big single-variety harvests. The rooms will eventually hold fewer strains with similar maturation times as the stock is built up and the demand increases, especially once the superb quality of these strains becomes more widely known. Besides

their proprietary varieties, Clade9 has acquired some of the best clones of more famous strains: Their Jack Herer is the most fragrant, terpinolene-rich cut I've ever experienced, and their Grand Daddy Purple is among the best GDP cuts I've seen.

Clade9 maintains a huge database of genetics, logging each strain's genetic history, maturation time and yield, THC and CBD figures, and profiles for nearly 40 terpenes. Besides THC and CBD, the company breeds for specific terpenes and future potential, such as varieties with higher levels of cannabichromene (CBC) and cannabigerol (CBG)—two cannabinoids that have also shown medicinal potential. The development and use of these genetics is shared with Spliffin, a Los Angeles-based vape and concentrate company. Clade9 has also developed the Clade9 Matrix, a system that compares genetic relationships and appears to reliably establish the uniqueness of their proprietary strains.

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A nugget of Purple Dream

### Grow Specs

The facility uses 4-by-8-foot beds and coco mediums for all stages of growth, with 3-gallon pots for vegging and flowering and a drain-to-waste setup with emitter arrays; the flowering rooms have CO<sub>2</sub> enrichment, walls lined with reciprocating fans, and plenty of A/C to cool the facility in the Arizona heat. All lights can be raised or lowered as necessary, and are monitored at the canopy level to maintain a predetermined intensity. Although Vector wouldn't tell me his optimum illumination, he did say that you can determine it through experience and an inexpensive lumen meter, and he described too much light as "shutting down growth and turning the canopy yellow."

In Vector's experience, recycling nutrient solutions, aeroponics and deep-water culture (DWC) can work well, but all are more difficult to run continuously at commercial levels without experiencing problems. The drain-to-waste setup simplifies fertilizing and water management and is an easier system for trainees to learn. Reclaiming water, especially from the A/C, is a future goal: Most of the reverse-osmosis (RO) water used here is transpired by the plants or evaporates from the mediums and can be easily collected from the A/C units. (I've seen up to 80% of the water used by a grow op recovered from the A/C, but due to metals from the condensing coils, it's often acidic and might need pH adjustment.)

The nutrients are from G-Max, starting with Base, a fertilizer that can be used throughout growth, but can also be modified using G-Max formulas intended for different stages, including flowering. I asked master grower Kelly from California's Sonoma County, whom I've known since the 1970s, to test G-Max's Swell, an additive applied during flowering that is purported to increase bud size and harvest weight. After consistently harvesting 18 pounds of flowers for years from one



Various varieties mature at different times.



Three gallon buckets are filled with coco and fed with dual-drip emitters.



Pruning keeps plants short and stocky.



Purple Dream plants fill out quite nicely.

of his formula grows—and never varying by more than an ounce—Kelly harvested 19 pounds from a garden he believed was maxed out after years of refining. That 6% increase in weight may not sound like a lot, but given the expense of growing weed—and the fact that this particular garden was seemingly perfect—he was duly impressed by an extra pound of top-quality bud.

G-Max develops fertilizers by in-house experiments and by carefully assessing the results. In a DWC system, the

plants' nutrient uptake was monitored to see which specific nutrients they were absorbing during the different stages of growth—including lab-testing leaf samples to determine which nutrients were missing or present in excessive amounts. Such experiments and monitoring led to formulas that work—and work particularly well with marijuana. Vector continues to test leaves from this grow to hone his nutrient plan, as not all varieties respond alike to a single fertilizing regimen.

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**Final Cut**

Developing this operation wasn't as difficult for Vector as it would have been for others because, after their earlier disappointments, the owners were willing to leave the decisions in his hands. Often, investors mistakenly insert their own pet ideas or begin to cut costs as a facility is being built, not realizing that this will end up costing them dearly in terms of future efficiency and production. Having enjoyed this first taste of success, Vector should have no problem convincing these owners to reconfigure the flowering rooms with the expectation of increasing yields to over 2 pounds per light.

Cleanliness is also mandatory, especially when it comes to keeping a perpetual-harvest facility pest-free. Given the absence of natural predators and inclement weather, indoor grows provide an ideal environment for pests and diseases to flourish. What many investors don't realize is that an infestation might require a complete shutdown while the whole facility is disinfected; consequently, it can be months before a resumption of harvests occurs. For this reason, every facility should have an isolation room where new clones can be



quarantined for several weeks of observation. Here, an isolation room has not been set up yet, since all of the initial clones were certified pest-free by Clade9.

If everything goes as well as this first harvest, and once Clade9 has fully trained the crew, Herbal Wellness will begin to install at least four more

eight-room perpetual-harvest grows in this facility; a kitchen for edibles and a concentrate room were already being outfitted. The nearby Herbal Wellness dispensary is clean and inviting, with lab-tested medicines from flowers to concentrates nicely displayed, and it's staffed by an enthusiastic crew. With the addition of these 18 California-quality varieties, Herbal Wellness stands to become one of the most successful dispensaries in Arizona. After all of the initial disappointments, I saw many happy faces surrounding the company's first successful big grow—and heard a few sighs of relief.

**Post-harvest update:** The first harvest actually yielded over 40 pounds per room, or 1.7 pounds per light. Bubba Skywalker, the first strain to hit the shelves, sold out in two days. As word spread of the superb "California quality" of its offerings, the Herbal Wellness dispensary sold more medicine and served more patients than at any time in its two-year history—in fact, 85 percent of the crop was sold in the first few weeks. And another professional test of G-Max's Swell showed an 11% increase in bud yield. ✨

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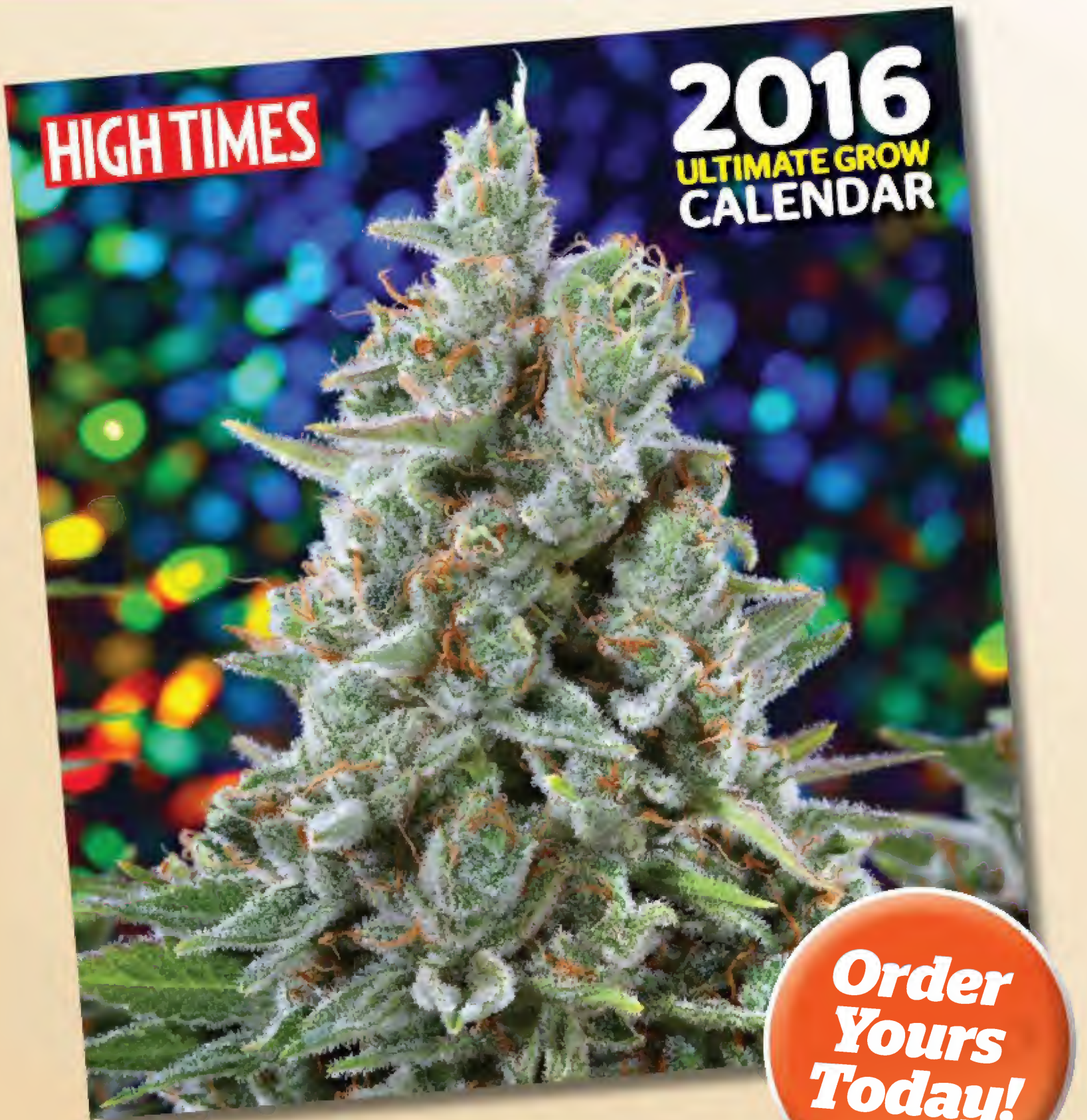
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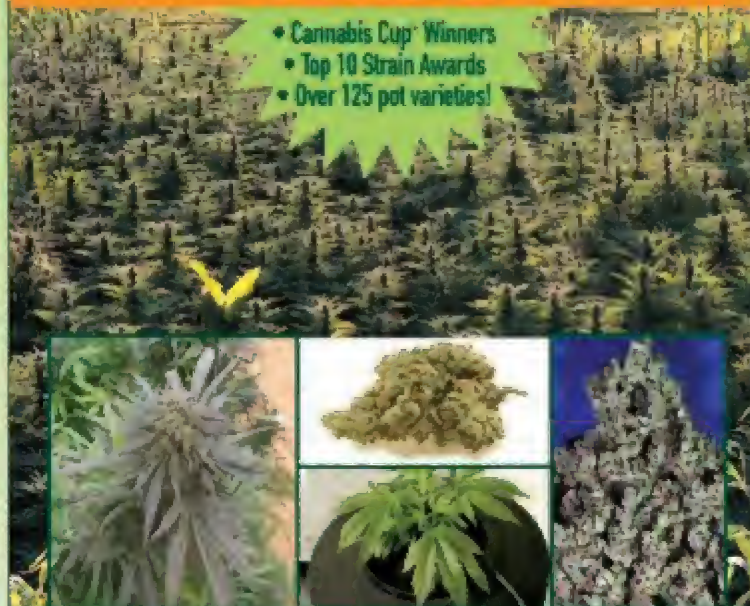
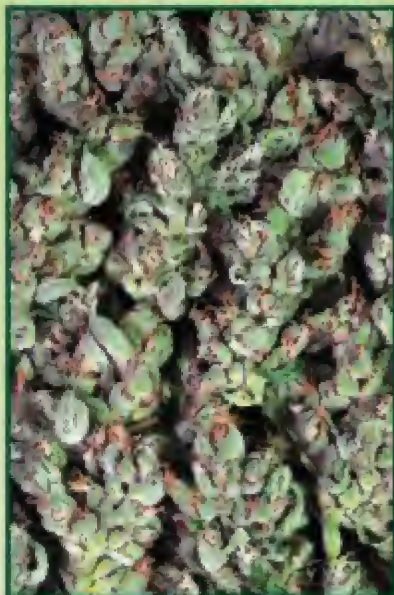
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INTERVIEW BY  
DAN SKYE

# JESSE VENTURA

## THE HIGH TIMES INTERVIEW

**I**NTERVIEWED JESSE VENTURA FOR *HIGH TIMES* BACK IN 1998, AS HE WAS BEGINNING HIS SUCCESSFUL BID FOR THE GOVERNORSHIP OF MINNESOTA. SEVENTEEN YEARS LATER, THE FORMER WRESTLER, ACTOR AND NAVY SEAL HAS LOST NONE OF HIS PASSION FOR SEEKING OUT THE TRUTH—OR THE COMMON-SENSE APPROACH TO POLITICS THAT GOT HIM ELECTED. HE'S NOW THE HOST OF ORA TV'S "OFF THE GRID," PROVIDING SHARP INSIGHTS INTO AMERICA'S MOST PRESSING PROBLEMS.

IN THIS WIDE-RANGING INTERVIEW, VENTURA TALKS ABOUT HIS TENURE AS GOVERNOR AND HIS DEFAMATION LAWSUIT AGAINST CHRIS KYLE, THE MYTHOLOGIZED CENTRAL FIGURE OF *AMERICAN SNIPER*. AND, OF COURSE, NO INTERVIEW WITH JESSE WOULD BE COMPLETE WITHOUT HIS RINGING ENDORSEMENT OF LEGALIZATION!

### You often say you're worried about America.

Very much so. There was a time when you would look at the United States and realize that all is well, better days are ahead. I don't have that feeling today. Compare the minimum wage in this country with minimum wages throughout the world: We're lagging woefully behind. We're creating rich and poor and destroying the middle class. You're seeing unions broken on a daily basis. Yes, unions can be bad, because they're run by people—and anything people run can turn bad. But the unions created the middle class. Without unions, there wouldn't be this unique thing we had called the middle class. But it will disappear with the unions. I didn't believe this 10 to 15 years ago, but now I do. It's a part of the globalization move to get us equal with Mexico and Canada so they can put us under one currency like Europe.

### Do you think we're headed in that direction?

Oh, God yes! Hillary Clinton's a globalist—no doubt about it. The globalists want rule under the elites.

Study Col. Fletcher Prouty's work. The



America's  
present direction  
disturbs Jesse  
Ventura.

character of Mr. X [played by Donald Sutherland] in *JFK*, Oliver Stone's movie, was based on Prouty. He said that a meeting took place after World War II. The elites were frightened because dropping the bomb meant even they could die. So a meeting took place; Prouty knew of it because he flew in China's Chiang Kai-shek to the meeting. It took place between Chiang Kai-shek, Stalin, Churchill and Truman. They came to the agreement that, from that point on, all wars would be fought in Third World countries. Look at every war we've been in since then—I have to believe what Prouty said is true.

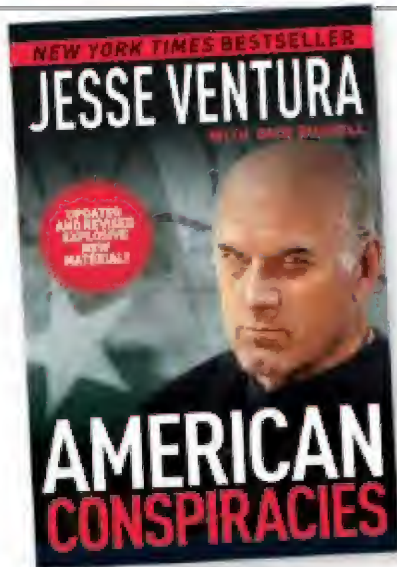
#### **The Kennedy assassination has always been an obsession of yours.**

I don't buy one shred of the so-called story of the Warren Commission. Read Harold Weisberg's book *Whitewash*. For 10 years, he tried to get the minutes to a special session of the Warren Commission [in January 1964], and he finally got it. A newspaper in Houston had reported that it had discovered Oswald had an FBI informant number and was a paid informant of the FBI. Now, logically, the Warren Commission's meeting would be to find the answer to the murder, wouldn't it? You know what the meeting was about? Covering it up—making sure the public didn't hear about this.

On the day they killed Jack Kennedy, our government died. Because if you can murder the president and get away with it, what can't you do? You can do anything.

#### **What inspired your political views?**

My dad. He'd sit at the dinner table, and he was very vocal. He had a right to be, considering he had six Bronze Stars from World War II. He fought in North Africa, Normandy, the Battle of the



Bulge, Anzio and Berlin. He was with the 699th Tank Destroyers under Patton. And my mom was also a World War II veteran, a nurse in North Africa.

#### **Was it a natural progression for you to go into the military?**

Probably, but over the objections of my dad—he was opposed to the Vietnam War before the hippies were. I remember talking to him about the domino theory [the notion that a communist victory in one nation would lead to a chain reaction of communist takeovers in neighboring countries]. He looked at me and said, "That's bullshit!" He said, "Somebody's making big money on this war, and that's the only reason we're there."

I've since learned that he was right ... and it carries on. Brown & Root got a billion dollars for dredging Cam Ranh Bay during Vietnam so our ships could anchor. Well, I guess they figured they didn't want to be called "war profiteers," so they changed their name. Do you know who Brown & Root is today? Halliburton. They've been profiting off wars since Vietnam, to the tune of billions. They got no-bid contracts in the Iraq War. I've been a mayor and a governor, and at no time did I ever hear that you could grant a contract without a bid. Somehow, at the federal level, that's okay. It's called corruption.

Do you know who Brown & Root is today? Halliburton. They've been profiting off wars since Vietnam, to the tune of billions.

#### **How did you make a transition from the military into the world of wrestling?**

I did two tours, a nine- and an eight-month tour in Southeast Asia. I'd been riding motorcycles after my first tour. In your first tour, you have what's called a "sea daddy," an old-timer who takes you under his wing. My guy used to ride Harleys. When you're overseas, your checks build up. So when you come back, you got a lot of money.

I'd been riding with two civilian friends in Coronado, Wally and Moose. When I came back from my second deployment. I ran into Wally and Moose again, who were now full-patch members of the Mongols Motorcycle Club. That was my transition out of the Navy: I became a full-patch member and rose to sergeant-at-arms in less than a year. I still have my colors. It was a unique transition out of the military, because bike clubs are militaristic. But you can grow your hair out, and you have a lot of freedom.

I left the Mongols and came back here to Minnesota and entered college, because I saw that it was probably a one-way trip to jail. One night, before I got out of the Navy, all my friends were busy, and wrestling was down at the auditorium. I went by myself, got a ticket in the front row. It intrigued me. I thought pro wrestling combined both

athleticism as well as theater. I met a former pro wrestler, trained with him for seven months, three nights a week. When he thought I was ready, I dropped out of school. I sent my photos around. Kansas City called. I got a tryout and the rest is history.

#### **What do you think you brought to the sport?**

Certain people have charisma—I don't know, auras about them. I was always a villain or a heel. I found it easy to anger people, to manipulate them, incite their emotions. That's really what you're doing in wrestling, at least in my day: performing the constant battle of good versus evil.

#### **How do you view your record as governor of Minnesota?**

I put in the first light-rail line. They're building it, and it's going to be a whole system. I also gave rebate checks. When the government over-taxes people, it's supposed to give it back.

#### **Didn't the state deficit increase under your administration?**

You have to understand that the legislature overruled my last budget, and they overruled both my vetoes—so if it rose, it's their fault. The deficit went up because they put it on the charge card, not me. Two years later, they had a \$5 billion deficit because of what they did.

At first, it wasn't hard to work with them. My first three years, I had a Democratic Senate and a Republican House; whoever I sided with prevailed. But in my last year, they got in bed together to oppose me. So when they say the deficit rose during my time, it did not! It went up because two years of that budget belonged to them, not me.

#### **What are you proudest of as governor?**

Winning it. No one gave us a chance. We only spent \$300,000—that's all I raised.



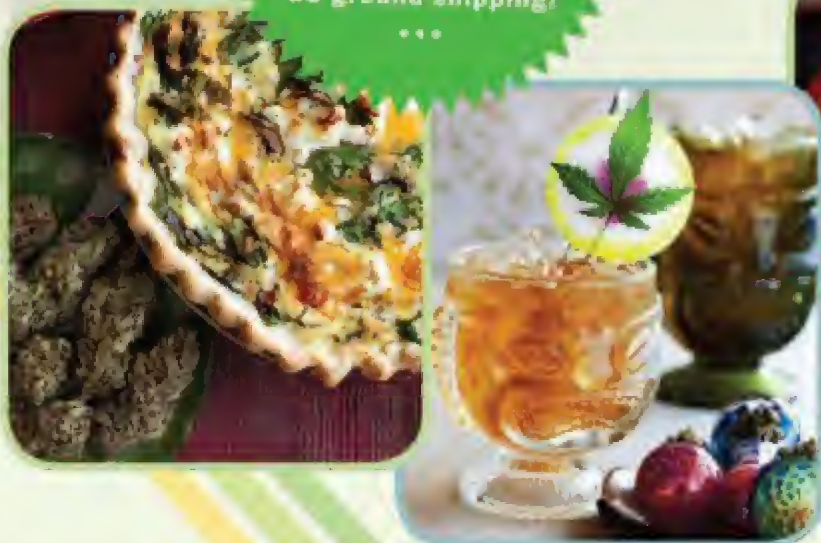
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I actually made more money doing the job than what I spent to get it, less than any other major political figure—governor, congressman, senator, anyone. I did that because of my dad. When I was young, my dad told me all politicians are crooks. I said, "C'mon, dad—you can't make a blanket statement like that." He goes: "They are. They spend a million dollars for a job that only pays a hundred grand."

No one in the private sector would spend more money for a job than what they're going to earn. Yet politicians do.

**While governor, you were criticized for taking a job as a broadcaster for the XFL, the defunct pro-football league. Do you regret that?**

No. It was on the weekend. In the entire four years that I was governor, the capital was never open on the weekend. Second of all, how come I wasn't criticized when I'd bale hay on the weekends at my farm?

**Did you feel like a target when you were governor?**

Of course I was a target.

**Did it piss you off?**

Not a bit. I was trained "Never get mad—get even." I've carried that through life. The only time I minded being a target was when the Minnesota media went after my children. I thought: "How low will they go, when they attack your children?"

**Do you think you were successful as a governor?**

Completely. And I would have been re-elected—there's no doubt in my mind. I remember my approval ratings fell to 45 percent at one point, from a high of 73—the

highest any governor had ever had. I'll never forget the media: "Well, what do you do now, Governor? Your approval rating is under 50 percent."

"Really?" I said. "I won with 34 percent of the vote in a three-way race. If I'm at 45, that means I'm up eight. In a three-way race, 45 percent is a landslide. I'd say I was pretty solid."

**In your campaign, you were a staunch hemp supporter. Did you push the issue as governor?**

I tried. I would have done anything to legalize hemp. I couldn't even get the legislature to vote on

Let's get our head out of the sand, let's modernize, let's lower our judicial costs in all the states.

unicameralism [in which all members deliberate and vote as a single group]. It's a better form of state government. All I wanted was for the people to have the opportunity to vote on it after an education process about the differences between unicameral and bicameral legislatures. But the legislature wouldn't even take a vote on it ... gutless cowards.

If you believe in something, then vote: Let the public know where you stand.

**What's your reaction to the rise of cannabis legalization?**

It's wonderful—it's long overdue. It should never have been made illegal.

**Have you smoked throughout your life?**

Off and on. As governor, never; as a civilian,

yeah. That's my business. But never when I was in office. If it's legal, I see no difference between that and a glass of wine. In fact, I don't drink alcohol. I haven't had alcohol since 2002. I wasn't an alcoholic; I just cut it out of my life completely. I don't like it.

**Cannabis is a recurring topic for you when you're on the air. What do you see holding up progress?**

Big Pharma, alcohol, tobacco ... they don't want marijuana legalized. Because if it's legal, you can grow it in your backyard. They don't want you doing that when they can sell you high-priced pills, which probably don't work, through an insurance company.

This is an entire economy waiting to happen. This is job creation, tax dollars, something to rejuvenate our pathetic economy. This is a billion-dollar industry. I always make the argument that the Constitution and the Bill of Rights are written on marijuana. If that can't make it legal, what would? It's the fabric of our nation.

Let's get our head out of the sand, let's modernize, let's lower our judicial costs in all the states. This is about jobs; this is about economics; this is about freedom.

**You're adding chapters to your book *American Conspiracies*. Tell us about that.**

One of them focuses on 9/11, with the redacted pages [in the 9/11 Commission Report] that state unequivocally that the Saudis financed the hijackers. Here's the theory that's been sold to everybody: 19 Islamic radicals, armed with box-cutters, defeated our multibillion-dollar



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air-defense system, all while conspiring with a bearded guy in a cave in Afghanistan. And we fully accept that.

Well, it's not true! But that's what they sold the American public. Everybody [on those airplanes] is dead, so how did they determine the planes were hijacked with box-cutters? Somebody came up with it, the media ran with it, and it became the truth. What proof is there that box-cutters were used?

#### What other topics do you include?

That everybody in the military is led to believe that our government will do anything and everything if you're lost behind the lines. It's a big fucking lie.

Then there's the stuff they're putting in vaccines. The mercury put in vaccines is lethal to you, and it's being done to save money. It would cost \$30 million more to do single doses without this shit, but they prefer multiple doses. It's cheaper.

#### You're often called "eccentric" or an "outsider." Why is that?

Conspiratologists are often called "eccentric" because we actually go beyond the mainstream media. Conspiracy theorists generally are more intelligent than the average public, because they actually study; they actually satisfy curiosity. Counter to that, the government gives us nothing but conspiracy theories.

#### Recently, you sued the estate of Chris Kyle, the "hero" of American Sniper. Can you explain?

I was down in Mexico. My son emailed me that a Navy SEAL had said he punched me out in a bar in San Diego because I was saying SEALs deserve to die. First of all, what doesn't make sense is that I was there because it's a tradition. I'm class 58 of the Navy SEALs; class 258 was graduating the next day. It's a

tradition that at the centennials and bicentennials, the old guys come back to attend graduations. If I hated the SEALs, why would I be there? Why would I be there honoring the 258 graduation? Kyle came out with this story that he knocked me out in the bar. Then the story changed. It's so ridiculous: In his book, tables and chairs flew, but in his deposition, he said it happened out on the street, and I hit my head on the curb and never got up.

Apparently, I did meet him on the night in question, but I probably met 50 people that night. I had no idea who Chris Kyle was.

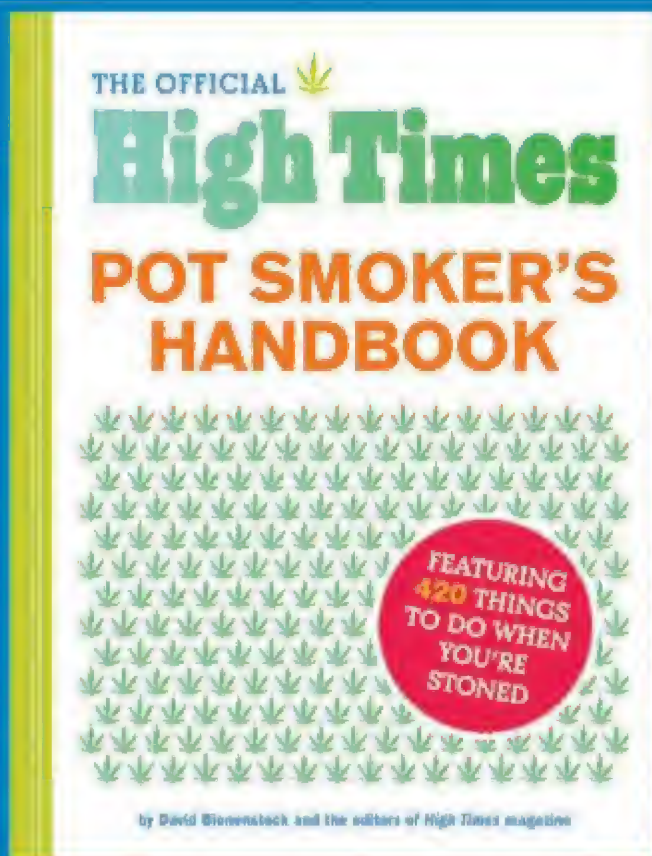
#### Did you get any flack for suing?

Yeah, huge. Bill O'Reilly got on TV and told me to drop the lawsuit and man up. Let's do a hypothetical. A veteran writes a story about you and accuses you of being a child molester. You sue because he won't retract—because you're not a child molester, and this would ruin your reputation. Then that veteran dies. Would you drop the lawsuit and go down in history as a child molester, or would you continue the lawsuit to seek the truth? What would you do? You'd continue, wouldn't you?

That's what I did. Yet they portrayed it that I was taking money from the widow and her children, which was a lie: Insurance paid everything for them. They ain't out one nickel. I'm out three-quarters of a million dollars. That's what it cost me to go to court for three and a half years. And their unethical attorneys tried to win the case in the court of public opinion rather than the courtroom.

Kyle did it all for fame and money. Tell me we haven't lost our moral compass when liars like Chris Kyle are turned into heroes. He's not a hero. A hero has to have honor, and a liar has no honor—so therefore he falls short. You cannot lie and have honor. ✨

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CHRONICLE BOOKS

# The Future of Home Extraction

How Mr. Extractor's simple, safe and effective design is changing the concentrates game. *By Craig Coffey*



The 1-pound Mr. Extractor boasts high yields and quick recovery.

ALTHOUGH CONNOISSEUR CONCENTRATES WAS FOUNDED ABOUT 18 MONTHS AGO, THE RESEARCH AND DEVELOPMENT FOR ITS CLOSED-LOOP EXTRACTION DEVICE, MR. EXTRACTOR, HAS BEEN UNDERWAY FOR ROUGHLY SEVEN YEARS. WE SAT DOWN WITH CONNOISSEUR CEO DREW JONES TO DISCUSS THE COMPANY'S FLAGSHIP PRODUCT AND THE FUTURE OF EXTRACTION.

## When did you first start working in the cannabis industry?

I've been growing and extracting since I was young. Cannabis has been my life's work. It's my distinct pleasure to run this company and supply my devices to every legal location on the planet. It seems fitting.

## Tell us about the Mr. Extractor R&D process?

As the inventor of Mr. Extractor, I was inspired years ago by the Tamisium Extractor. I set out to create my own system with improvements that I felt would be beneficial. I conferred with others who were pioneering and developing early extraction devices, and ended up designing a 3-pound device very similar to the current iteration of Mr. Extractor.

Originally, it was designed to be both active and passive. However, after running the device a few times, I quickly realized that operating in active mode created situations I was not comfortable with. There were very high pressures and high temperatures, and the pumps were not fire-rated. Cannabis oil was entering the pumps and degrading the seals, destroying the pumps and then passing contaminants through into the extracts. I had in mind to retail these devices at some point, but I couldn't sleep knowing that I would be designing and selling a system that operated with a pump that was contaminating the final product. I decided to abandon the HVAC recovery pumps and focus on amplifying the thermodynamic factors that were assisting in the recovery process. By slightly modifying the device,

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“Mr. Extractor was never meant to compete with the complex extractors of today’s market; it’s designed for simplicity, beauty, speed and ease of use.”

we were able to operate it passively very efficiently.

During this time, I developed a relationship with my manufacturer, and over the next couple of years, we built prototypes and modified the existing device until we had some models that worked extremely well passively—no pressure, low temps, fast recoveries. We were extracting 3 pounds and recovering in around 20 minutes.

What I can also tell you is that money cannot buy the support that has been given to us. Our R&D consists not only of our staff, but countless welders, engineers and specialists in the “high-purity sector” that have come together and donated their time and knowledge to help us make this product simple, beautiful and functional.

#### What unit sizes are available?

We started out with a run of 8-ounce units and have since upgraded to a 1-pound unit, which will be the flagship Mr. Extractor. We have an amazing 5-pound prototype that recovers in as little as 24 minutes passively and operates around 5 PSI or in a vacuum, depending on the water temperatures.

We know there’s a market out there for a smaller, entry-level closed-loop system too, as people want to move away from open blasting. But the alternatives are very expensive for the beginner. We’ve gotten a lot of requests and will be designing an entry-level 4- to 6-ounce Mr. Extractor, passive and closed-loop, so that we can offer the community a reasonably priced and safe beginner’s device. We think of these smaller devices as a sort of community service, since the price we’ll be offering them at will leave very little room for profit. Our goal is that our clients will use the device, make

some money and eventually step up to the larger units.

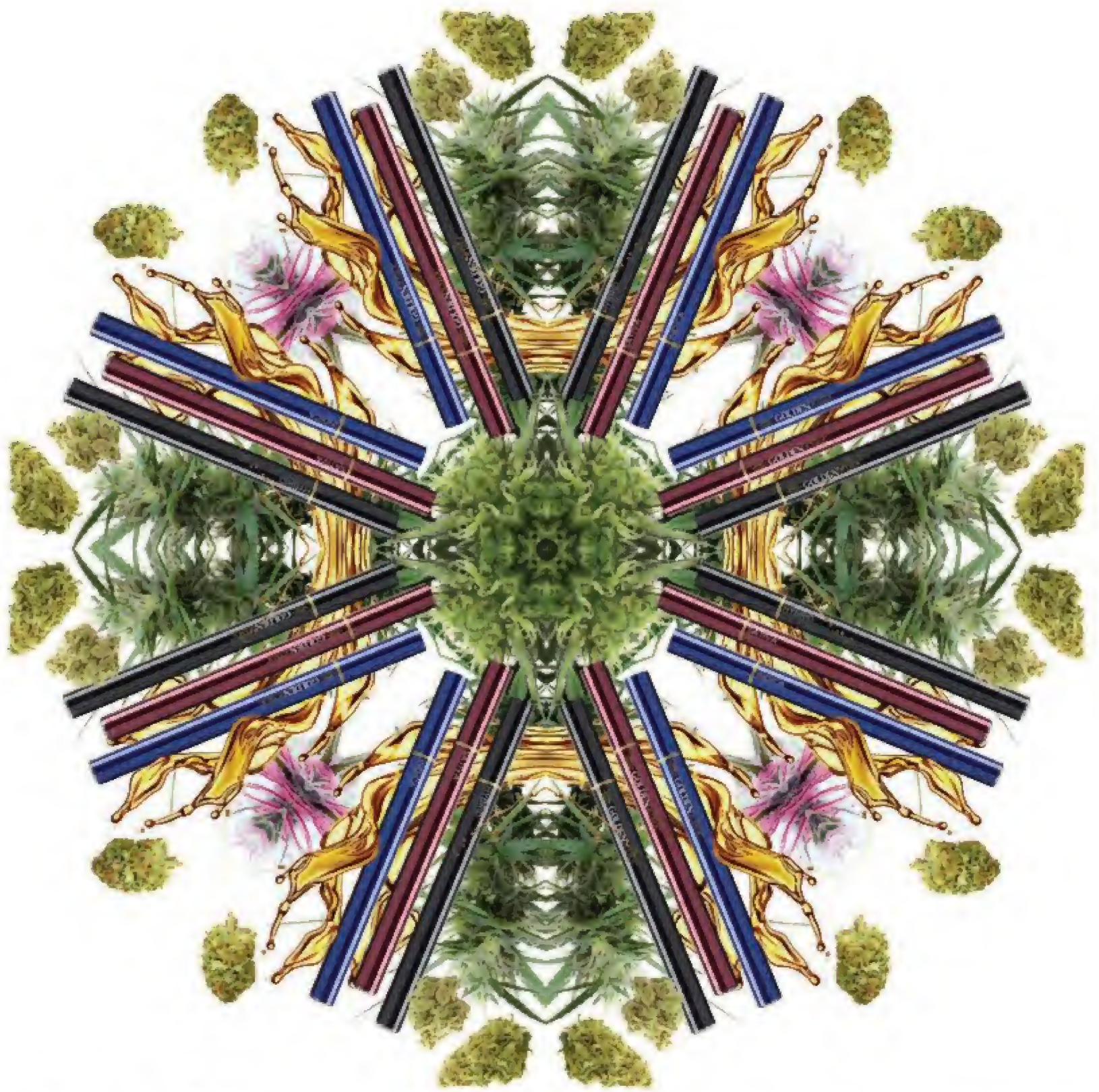
#### What’s next for Connoisseur Concentrates?

Connoisseur Concentrates is much more than Mr. Extractor. Mr. Extractor embodies a thermodynamic principle of recovery that we have dubbed ThermoFlux Technology, or the thermodynamic refluxing and recovery of a solvent. It is this principle, which is scalable, that powers our multi-capacity-sized line of extractors. We have designs for 10- and 20-pound passive extractors that will work in the same timetables (20 to 30 minutes or faster). Our engineers are champing at the bit to design fully automated butane-extraction and -recovery devices. What most people don’t realize is that we’ve included the use of refrigerant-recovery devices in our patents and aim to incorporate them into our systems down the road, with an emphasis on safety. We will also be making propane systems as well as food-grade water-separation systems.

#### Where do you see the company in five years?

I see our company having a very large presence. We view the majority of current extraction devices as very complex, well functioning and beyond the needs of the average consumer. Mr. Extractor was never meant to compete with the complex extractors of today’s market; it’s designed for simplicity, beauty, speed and ease of use. In the coming years, the market will split into very simple low-volume extractors and extremely complex high-volume extractors. We will have a hand in both. 🌿

To check out video of the Mr. Extractor in action, go to [high-times.com/mrextactor](http://high-times.com/mrextactor).



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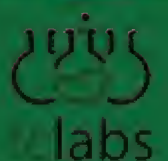
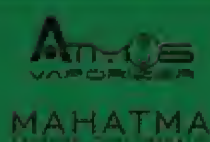
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# Expert Grow Advice

Windowsill weed, greenhouse security, power outages, strain names and more...



Send your cannabis cultivation questions to @deardanko or deardanko@hightimes.com.

SUBJECT: **Balcony Grow**

FROM: **Smokeahontas**

🌿 My boyfriend and I are growing marijuana for the first time. We found two seeds in some weed we bought, and we also have seeds that we got at the Cannabis Cup. We are currently growing them outdoors on our balcony in Southern California. The plant we have in a hanging pot seems to have stopped growing. The other seeds are growing in a 3-gallon pot. My question is: Can wind affect the plants? Also, what would you recommend to help them continue to grow and be healthy if they are outside plants?

Dear Smokeahontas, Wind can definitely affect plant growth: Strong winds in particular will keep growth stagnant, as the plant works hard just to stay upright and alive. I would recommend transplanting the hanging plant into a larger container and keeping it in a place where it's protected from strong winds. Also, keep your plants under full sunshine and water them with a nutrient solution as necessary, and you should see them bounce back and recover. Remember, the bigger the container their roots are in, the larger your plants can grow and the heavier their yields will be. More root, more fruit!



Marijuana can grow on balconies that get plenty of sunlight.

*Danko Tip:* Oxygenated compost tea can be used as a foliar feed or as a soil drench to provide a mild dose of nutrients



Branches of Matanuska Thunderfuck hanging to dry

SUBJECT: **Wet Dry**

FROM: **Cloud**

Hi, Danny, I have a story for you. About three weeks ago, I was drying my Northern Lights x Blueberry buds in my friend's basement in a closet-like room. I had two fans going—not too powerfully—plus a humidifier on, because my friend said I needed the humidity. I had the humidifier all the way up, and I checked on my hanging buds every two days. On the eighth day, they had lots of white, fuzzy mold on them. It was an utter tragedy for me, being my first grow.

My questions for you, Mr. Danko: Do I need a humidifier for hang-drying? Is moisture important for hang-drying? Are fans important for hang-drying? What did I do wrong? Thank you gratefully.

Dear Cloud,  
I think your friend ended up giving you a bum steer. In most places, when it comes to drying marijuana, humidifiers are not necessary—in fact, many growers use dehumidifiers in order to remove moisture from the air that's coming from the drying plants. With the exception of places like Colorado and Arizona, where dry air is the norm, it's more likely that you need to pull water from the air rather than add it.

It's very important to maintain temperature and humidity at the proper levels throughout the drying process. I recommend 65°F to 75°F and right around 50% humidity. Lower than 45% will result in plants drying too quickly; higher than 55% will lead to mold such as you experienced. Also, make sure

your drying is done in a cool, dark place with decent ventilation, but avoid having fans blowing directly onto the drying branches. Remember, light, heat and air will all degrade buds, lowering their aroma, flavor and potency. If you want the highest-grade cannabis, invest in the proper equipment to ensure an optimal drying experience. And last but not least, be sure never to smoke, vaporize or otherwise consume moldy marijuana!

SUBJECT: **Growing With Gems**

FROM: **Southwestern Arizona Grower**

I grow indoors and out, and I've always placed gemstones with metaphysical properties that correspond with the root chakra (agate, black tourmaline, smoky quartz, most red, black and gray stones, etc.) at the base of my plants to promote vigorous growth. That's my own hippie logic, but have you ever heard of anyone else trying this? Have there been any studies on it?

Dear SAG,

I have no information, positive or negative, on the use of gemstones around cannabis plants, nor do I know of any studies on the subject. My personal opinion is that they'll have no good or ill effects on the plants themselves, so if it makes you feel better, by all means, do it. The important thing is that you don't put all your energy into ensuring that the gemstones are "working" and thereby ignore other problems that can arise in the garden.

My friend EZ-Gen always says, "Never put minor before major"—meaning don't let the little things get in the way of tending to the bigger issues such as temperature, humidity, nutrient levels, watering regimen and pest control. As long as the gemstones aren't your foremost concern, let them sit around your plants and do their thing.

SUBJECT: **Flowering Clones**

FROM: **Big D Papa**

I have a question about some clones that I got from a friend. They were all about 6 to 12 inches in height, but they were already budding. I don't know how this happened, since they were grown outside, but I'd like

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to know if this will affect their overall yield. Should I toss the clones and start over, or is there still hope for them to survive and thrive down the road?

Dear BDP,

I've seen this problem arise plenty of times: People forget to clone their plants during the vegetative stage and then think they can get away with doing it during flowering. The problem is that the flowering clones must then revert back to the vegetative stage, and this process takes time and can also result in shocking the plants into strange behaviors.

I strongly suggest taking clones only from vegetating plants. In this way, you'll avoid having to reveg them, as well as issues like the clones turning into hermaphrodites or mutating in other ways due to stress (for example, sometimes the leaves will come out twisted or with only one or two blades). All of this is time and effort wasted that could have been spent strengthening the plants for their eventual flowering stage.

Also, the reason this happened outside is likely because the plants weren't receiving more than 12 hours of light per day. If you increase their regimen to 18 hours or so with supplemental lighting, you will avoid having them flower prematurely.

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These seeded Critical buds were grown outdoors in Spain.

SUBJECT: **Seeded Buds**

FROM: **Lisa O.**

Good morning from Grand Junction, Colorado! I have an indoor grow, and during a recent harvest I found seeds in one of my ladies. I have eight plants growing at a time, but only one came out that way, with maybe a dozen seeds or more. Also, I haven't had any males in the growroom. So what happened? And can I make those seeds my own and call them what I want? And why would it happen to one plant and not any of the others?

Dear Lisa,

There are several possible reasons why your plant became seeded. One is that pollen from a male cannabis plant found its way into your garden; but it's far more likely that you had a hermaphroditic plant inside your space. Tiny male flowers can emerge from "female" buds without being noticed and release small amounts of pollen in a localized area, resulting in a handful of seeds in a single plant's colas.

As for those seeds, they're almost definitely not going to produce anything you'll really want to smoke. "Feminized" plants

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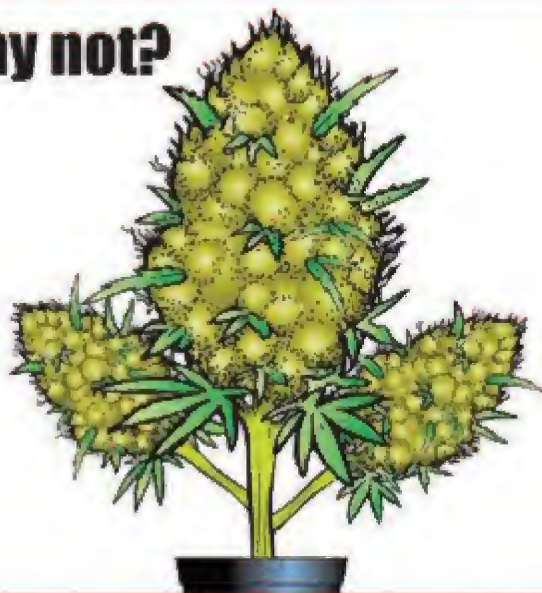
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that turn out to be hermaphrodites and then “self” themselves will produce half-female and half-hermaphroditic seeds, burdening you with the same problem you had in the first place. It's better to grow from seeds that have been produced by breeders meant for potency and production.



Yellow leaves often signify nitrogen deficiency.

SUBJECT: **Yellow Leaves**

FROM: **Hybrid Sean**

🌱 My first indoor grow of Purple Kush is three weeks old today. Everything, including the transplant, went great. I started with a neutral soil, and when I transplanted into a new 5-gallon bucket, I layered the container: The bottom layer was FoxFarm Ocean Forest; the middle layer was a mix of FoxFarm and the original soil; and for the top layer (as well as in and around the transplant hole), I used the original soil.

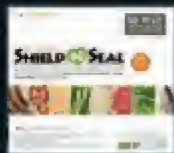
My problem is that the plant's two round leaves (the first ones from the ground) are now yellow, wilting and dying, and the next set of actual marijuana-looking leaves are getting yellow at the tips. I haven't used any nutrients yet. My research tells me that it's either a nutrient deficiency, or that maybe the roots are just now reaching the FoxFarm layer (one week since transplant) and are in shock from the hot soil. Is this normal? It is critical that I get this right, since if it's nutrient toxicity or nutrient burn, I surely don't want to add nutes—but if it's a deficiency, I don't want to withhold them and stunt the plant's growth or, even worse, kill it. What should I do? Please, Danko, help me!

PS: I have some 100% organic additives like bat guano, worm castings, kelp, etc., coming in the mail in 10 days. Can I wait?

Dear Sean,

I wouldn't worry about the two round leaves (known as cotyledon leaves) yellowing, but you should be concerned about the newer serrated leaves showing these signs. If they're yellowing at the tips and the tips start looking burnt, you've overfertilized the plant. If the entire leaf is slowly going yellow, you most likely have either a nitrogen deficiency or a fluctuating pH (the level of acidity or alkalinity in your soil).

My recommendation is to flush your bucket with plain, pH-balanced water. The tub is a safe, clean place to accomplish this task. After the plant is well flushed, start feeding it using a half-strength nutrient formula, and be on the lookout for any new signs of nutrient deficiency or burn. ✨



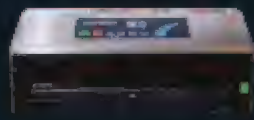
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*Miss November:*  
**Ashleen Lewis**  
Cannabis enhances all facets of this New York activist's life.

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Ashleen takes up at the Chapel of Sacred Mirrors.

**Ashleen Lewis walks** across the expanse of greenery that's at the Chapel of Sacred Mirrors, the art sanctuary and interfaith church founded by artists Alex and Allyson Grey. It's a quiet oasis in Wappinger, NY, about 80 miles north of New York City.

Ashleen, born and raised in the Poughkeepsie area, calls it one of her favorite places. "It's a representation of freedom," she says. "Nowadays, we think we're free, but there are so many stipulations, so many rules. Here, you can experience real freedom."

As she walks, Ashleen limps slightly, the result of a severe car accident last winter. As a member of NORML, Ashleen is involved in the efforts to legalize marijuana in New York, where

she learned that the best way to get young people involved in politics is through cannabis law reform. Now, her activism has a new dimension.

"When I took the prescribed pharmaceuticals after the accident, I hated the feeling," Ashleen says. "I was totally detached. I want to be engaged with my life. So I turned to cannabis for my medication."

She wants others to benefit, too. "For me, cannabis is about being spiritual, about being positive and keeping my mind at peace."

Ashleen is a licensed Reiki and crystal healer. "I'm 23," she says. "There are so many paths ahead of me. I guess that's the fun of being young." ✨



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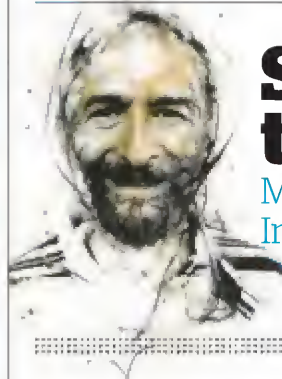
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## Smoking Out the Facts

Media fails, tobacco and pot, Internet searches, and OG Kush.

Got a question for Dr. Mitch? Email him at [420research@gmail.com](mailto:420research@gmail.com).

According to my brother, new research proves that medical marijuana really isn't any good.

Help!

*I. Needmymeds*

Hi I.N.,  
A review in the *Journal of the American Medical Association* addressed medicinal cannabinoids and found that some ailments respond well to them and others poorly. But here's the catch: The research under review was overwhelmingly about *synthetic* THC (such as Marinol) and THC-like drugs; only two of the studies looked at actual cannabis. So the conclusions don't really apply to medical marijuana—and, needless to say, nobody has claimed that pot is a cure for *everything*. Unfortunately, the media jumped to the wrong conclusions and ended up botching the message.

Can our beloved plant protect me from cigarette smoke?

*Nick O'Teen*

Hi Nick,  
A team of researchers, including investigators from California and Colorado, found that folks who used both the plant and tobacco were less likely to develop emphysema than those who smoked tobacco alone. However, the effect was very, very small: Essentially, cannabis made developing emphysema 2 percent less likely. So tobacco smokers shouldn't count on cannabis to protect them (and cannabis users should always remember that the vaporizer is your friend).

Not to sound paranoid, but can your Internet searches reveal if you're using marijuana?

*Miss Trust*

Hi Miss T.,  
A recent article examined Google Trends data for searches about marijuana and related terms. At the state level, these searches correlated significantly with cannabis use: higher in states where more people reported use, and lower in states with less use. I can't say for sure about individual IP addresses, but my opinion would definitely sound paranoid.



Where does a name like "OG Kush" come from?

*Woody "Ink" Slinger*

Hi Woody,  
The marketing instincts of cannabis growers are astounding! Despite the obvious "original gangster" allusion, "OG" purportedly stands for "ocean-grown," implying stellar quality, while "Kush" likely refers to the Hindu Kush mountains, probable home of the first *indica* plants. 🌿

*Dr. Mitch Earleywine is a professor of psychology at SUNY Albany and the author of Understanding Marijuana and The Parents' Guide to Marijuana.*

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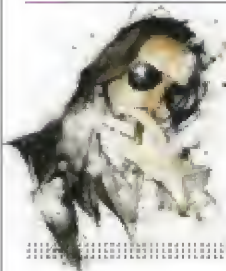
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## Hats Off to LK

Saying goodbye to a fellow freedom fighter and dear friend.

**W**ith his flamboyant shirts, pin-bedecked derby and jovial disposition, there were few in the cannabis community as universally beloved as Oregon activist Larry Kirk—known affectionately to his friends simply as “LK.”

A lifelong advocate of marijuana legalization, Larry was a proud supporter of NORML and a personal friend of Keith Stroup and the late Jack Herer. He was also an annual fixture at both the Seattle Hempfest and Portland’s Hempstalk festival (where they even named a stage after him), and served as the

grand marshal at the Portland Global Cannabis March in 2015. An Army veteran, LK followed in the footsteps of one of his idols, fellow Oregonian Dr. Phillip Leveque—a distinguished forefather of today’s medical marijuana activism by vets—helping to establish a veterans’ night at the World Famous Cannabis Café, and spearheading Veterans for Measure 80 to mobilize support for the state’s 2012 legalization bill.

When it came to *High Times*, you couldn’t find a more devoted fan: Larry sang our praises every chance he got, judged seven of our Cannabis Cups and attended many more—always arriving bearing gifts and wine for the *HT* crew and his fellow judges.

Wearing several hats (a derby, a fedora, a baseball cap...), LK was also a talented photographer, guitarist and singer, as well as an aspiring music promoter who represented several rock and hip-hop artists from Portland, most notably Justin James Bridges—a soulful singer/guitarist recovering from a spinal injury, with whom Larry felt a deep kinship.

It was last August in Portland, at a party in the home of our friends Madeline and Senior Martinez, that LK gave us the bad news: His lung cancer had advanced to Stage IV, spreading into his bones and manifesting as a tumor pressing on his spine. Despite radiation therapy

and the Rick Simpson Oil regimen, his doctors didn’t expect him to survive the year. But Larry did survive it—and lasted well into the next.

With his medical bills taking their toll, LK’s family created a *GoFundMe.com* page to help him live out his short bucket list: to visit the pyramids of Mexico City and



Larry leading the Global Cannabis March in Portland, May 2015

judge the Cannabis Cup in Amsterdam one last time. Thanks to many generous donations, and despite severe and constant pain (which only the RSO could ease), Larry not only made it to Amsterdam, but to the Cup in San Bernardino the following February. As it turned out, that would be the last time we’d ever see him: LK passed away on the evening of June 18—just two weeks before the legalization law that he’d fought for went into effect in his home state of Oregon.

Though I can’t recall exactly when and where we first met (I suspect it may have been in Amsterdam in 2011), I felt as though I’d known LK for decades. He was a kind and compassionate soul, bursting with joy, humor and positivity. He will be remembered with great fondness and admiration by his fellow stoners and activists across the country, and will forever be a member of the *High Times* family.

Fare thee well, LK... and say “high” to Jack for me. ✨

You can donate to LK’s family at [www.gofundme.com/hOwt3k](http://www.gofundme.com/hOwt3k).

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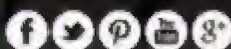
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# New Data, New Resolve

Examining the constituents of America's "marijuana middle"—and why they matter.

Allen St. Pierre is executive director of NORML. Visit [norml.org](http://norml.org).

**E**lected policymakers and activists should take heed: The nonpartisan advocacy group Third Way recently published a set of surveys focused on marijuana-law reform. The surveys revealed in great detail who does (and who doesn't) support the end of pot prohibition, as well as what some of the possible winning (and losing) campaign narratives are for reformers.

Thus, the conventional notion of an out-of-touch, pro-Drug War GOP is quickly becoming outdated, at least at the party's grassroots level; these days, most Republicans are either pro-legalization or squarely in the "marijuana middle."

Among independents, half favor legalizing both medical and recreational use, with another 27 percent supporting medical use only. A full 74 percent support

4) "Voters believe states are responsible actors on marijuana."

5) "Banking messages work [i.e., arguments concerning the unfair banking laws faced by cannabusinesses]—but only after a long explanation."

Third Way's cogent analysis concludes: "As opponents lean heavily into values-based arguments regarding teenage marijuana use and highway safety, more research still needs to be done to identify a compelling value for legalizing recreational marijuana—the way that compassion underlies support for medical marijuana. But ... we do now know significantly more about the marijuana middle—a group that recognizes the conflict between state and federal marijuana policy and the need to resolve it. A supermajority of Americans believe that federal policymakers have a role to play in this discussion, and that they should act to provide a safe haven from federal law for states that have already legalized marijuana and are acting responsibly to strictly regulate it."

This analysis helps explain why a majority of Americans now supports ending pot prohibition when, according to government surveys, only 14 percent of the population uses pot. The political fulcrum has decidedly shifted in our favor—at long last. Now we need to embrace this moment wisely. 🌿

A majority of Americans now supports ending pot prohibition when, according to government surveys, only 14 percent of the population uses pot.

The surveys found that over 50 percent of the American public supports legalizing cannabis. Not surprisingly, Democrats are heavily in favor, with 87 percent supporting medical marijuana and 64 percent backing recreational use. Seventy-eight percent also support "safe haven" legislation," with 53 percent strongly backing such measures. (Safe-haven legislation would protect states that have legalized marijuana from reprisals by the federal government.)

Republicans, for their part, overwhelmingly support medical use (68 percent) but not recreational use (32 percent). However, a solid majority (54 percent) supports safe-haven legislation, and nearly a quarter of those people support it even if they personally oppose legalizing recreational use.

safe-haven legislation, with 47 percent expressing strong support.

Interestingly, men are more pro-legalization than women: 52 percent of men support legalizing both medical marijuana and recreational use, compared to 45 percent for women.

Third Way's report also proposed five main points that reform advocates should keep in mind when trying to persuade the marijuana middle:

1) "Medical marijuana opens the conversation, but it doesn't close the sale."

2) "Decrying the War on Drugs has limited appeal."

3) "Don't overhype the risk of prosecution."

## FREEDOM FIGHTER

### Hoosier Hero

Indiana's Chris Thompson organizes the heartland.

Chris Thompson grew up on a steady diet of misinformation from anti-marijuana groups like DARE and the Partnership for Drug-Free Kids. But soon he discovered that the War on Drugs was based solely on political propaganda and lacked any scientific backing.

Chris took action by forming

several NORML chapters across Indiana—organizing informational meetings, hosting public demonstrations and building a network of grassroots volunteers, while maintaining positive relationships with his state and local representatives.

Chris currently serves as the executive director of Purdue NORML and also sits on the board of Indiana NORML. In addition to his activism



reforming the Hoosier State's marijuana laws, he is majoring in biological engineering at Purdue University.

Most recently, Chris accepted a position as an intern with national NORML, working out of the organization's Denver office to help form new chapters, implement more efficient systems, provide extra support to existing chapters, and promote legalization efforts throughout the

country. Chris is tireless when it comes to ending the federal government's misguided war on this useful plant—and on our personal freedoms as well.

"When I first started researching cannabis legalization," Chris says, "I was actually completely against it. But the more I researched and learned, the more I realized that I had been lied to about cannabis all of my life. I also found my passion for a career in legalization."

By Kevin Mahmalji, NORML national outreach coordinator

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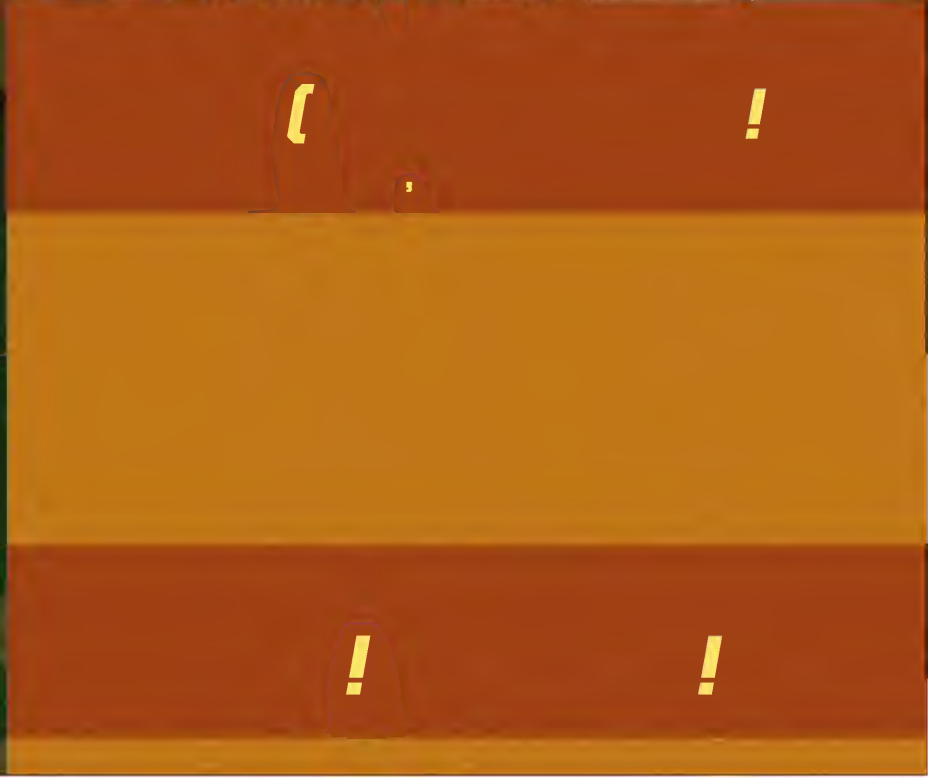


**NUG OF THE MONTH**

**FLOWER POWER**

 Feel free to publish this photo I took of my own strain called Ghost Berry Haze. *JVans*





CLOSE-UP OF THE MONTH

WALLY WORLD

Here's a shot of Wally OG (Phantom OG x Ghost OG) from Kind Pain Management's OG harvest. Cheers! @fillyoureyes



COLA OF THE MONTH

UNITED KIND-DOM

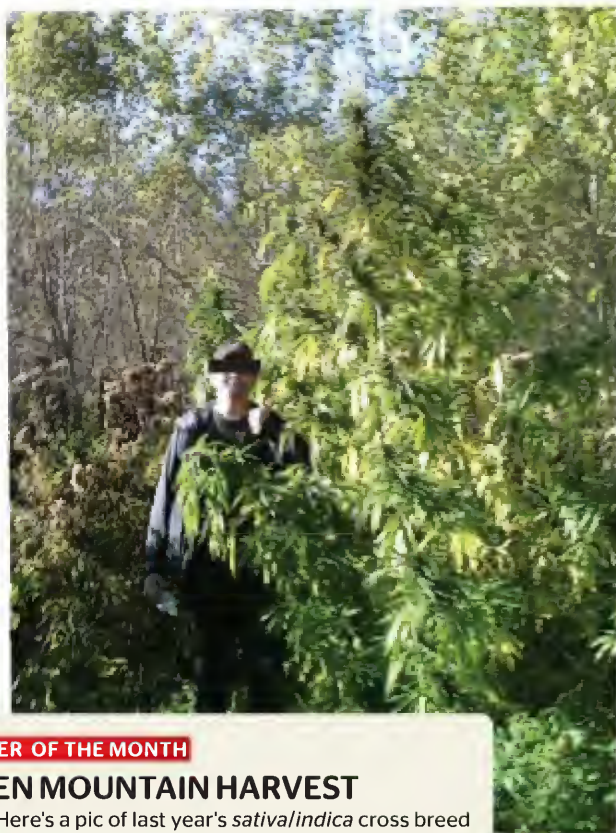
Guide Dawg from Holy Smoke Seeds. Nick T.



GROWER OF THE MONTH

GREEN MOUNTAIN HARVEST

Here's a pic of last year's sativa/indica cross breed in a buddy's back yard. I'm 6'1" and not crouching. You may print my face as I'm way too old & sick to care anymore. Thanks! Steve Merrill, North Troy, VT





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Who were this year's stars?

## ► The Top 10 Strains of 2015

What a great year for ganja! Senior cultivation editor Danny Danko sorts through a treasure chest of the tantalizing strains that tickled our pot palates and dominated the awards at the High Times Cannabis Cups.

## ► Harvest With Jorge!

Cultivation legend Jorge Cervantes lays out his encyclopedic knowledge on the subject of reaping bountiful buds—everything from determining when and how to harvest to the art of maintaining aroma, flavor and potency.

## ► LA Stars

Although the city of Los Angeles hasn't always been friendly to the medical marijuana industry, some dispensaries are making a name for themselves. *High Times* editor-in-chief Dan Skye visits two top outfits: AHHS and Greenwolf LA.

## ► A Celebration of Hippie Chicks

Famed rock'n'roll photographer Jay Blakesberg's new book, *Hippie Chick*, spans his illustrious 35-year career to document America's most spirited earth mothers, fire-twirlers, hula-hoopers and female festival-goers. Call it a "visual anthropology" of the counterculture!

## ► The Cult of Campbell

Cult-movie king Bruce Campbell sits down to discuss "Ash vs. Evil Dead," the latest chapter in the classic horror/comedy saga, which debuts as a series this Halloween on Starz. Plus, Campbell tends his own medical marijuana garden that's anything but scary!

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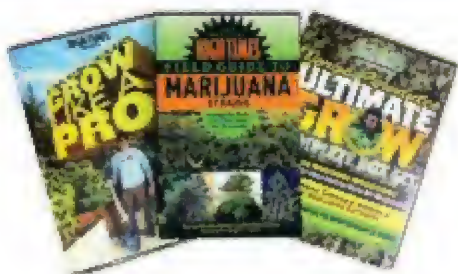
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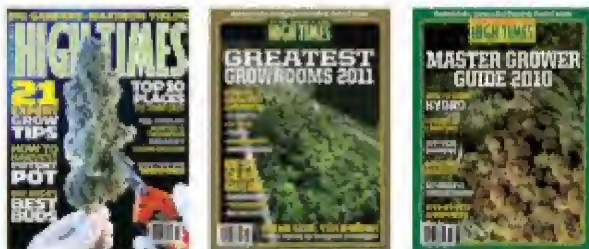
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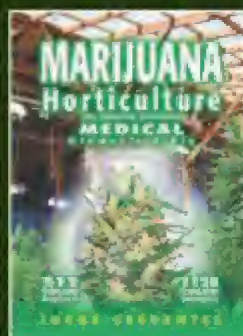


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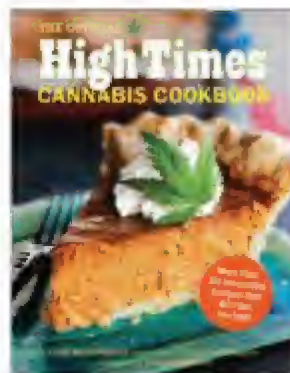


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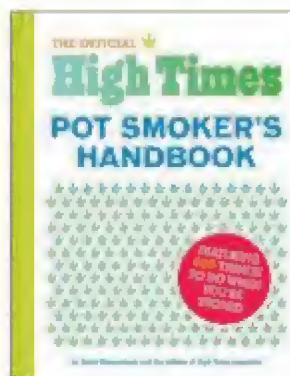
## High Times Books



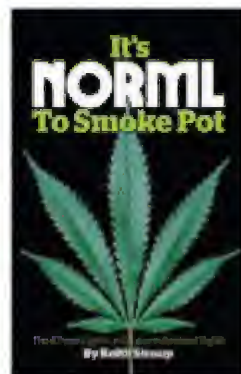
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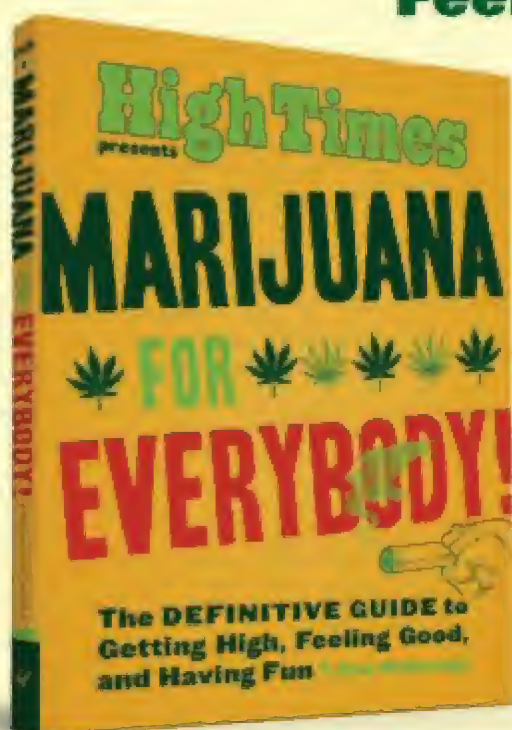
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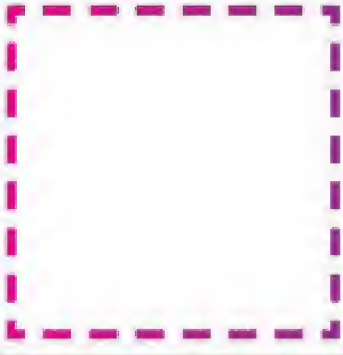
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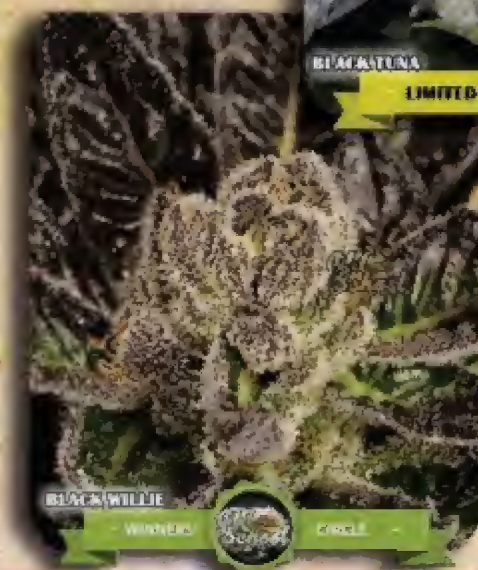
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- G13: Greenhouse 13 x Skunk \$80
- Golden Temple Kush \$100
- Grand Daddy Purple \$100
- Grand Daddy Purple X Cinderella 99 \$80
- Harlequin CBD \$100
- Harmony \$59
- Harmony X Thai \$70
- Hindu Kush \$50
- Hippie Crippler \$80
- Island Sweet Skunk X Skunk \$80
- JoJo Kush \$50



# 100% REEFERMAN GENETICS

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# AI VACUUM OVENS - WINNERS' CHOICE -

HIGH TIMES



@AcrossIntl

AI's award winning vacuum ovens are the No.1 choice for cup champions\*. They are your BEST choice for curing and converting botanical extracts. With deep vacuum level they can operate at temperatures which allow evaporation and degassing/purging to occur rapidly. This increases productivity and ensures the production of superior quality products with minimal processing time.

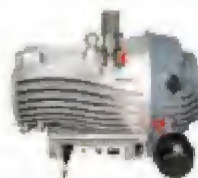
Check out our 3.2 and 7.5 cubic foot ovens with new **internal shelf heating technology**: each shelf in these ovens has its own heater, **in-shelf temperature sensor** and temperature controller; together with high quality thermal-conducted aluminum and our new low proportional controller technology, the result is perfect uniformity, accurate temperatures, super-fast heating rates, minimum heat loss/exterior temperature and ultra-low power consumption.

Our newly re-designed ELITE series vacuum ovens feature 5-sided jacket heating system that gives you **an industry leading 3% temperature uniformity across all shelves**, they also provide excellent temperature accuracy, exceptional build quality, and fast heating rates, covered by an industry best **2-year warranty**.

\* Check our Instagram posts for a list of winners



Re-designed Elite 4.4 Cu Ft 20x20x20" vacuum ovens with 5-sided jacket heating, adjustable gas back-fill and 6 aluminum shelves



Edwards vacuum pumps and accessories



Welch diaphragm pumps and accessories



AccuTemp 1.9 Cu Ft 16x14x14" vacuum ovens with 4 sided heating, adjustable gas back-fill, 3rd gen LCD low temp controller and 5 aluminum pan shelves



## 7.5 Cu Ft

AccuTemp-75 22x24x25" vacuum ovens with 5 heated shelves, 5 in-shelf temperature sensors, 5 controllers and adjustable gas back-fill capability

VISIT US AT



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